see on page 10:

Prefabrication speeds concrete caisson job

tractors and Engineers

JULY 1953

Two Washington revolving cranes and a Colby double-cantilever crane place concrete from a high trestle for Folsom Dam on the American River.

See story on page 58.

Time saver for Florida traffic

Jacksonville's new express highway system

Now served by 500,000 sq. yds. of hot-mix Texaco Asphaltic Concrete

Hot-mix Texaco Asphaltic Concrete being laid over a limerock foundation on approach to John E. Matthews Bridge, which spans St. John's River in Jacksonville. This and other sections of new expressway system at Jacksonville were constructed by Duval Engineering and Contracting Company of that city.

For two years, the Florida State Road Department has been constructing an elaborate expressway system, which is designed to speed the flow of through traffic converging on the city of Jacksonville from all directions. Approximately a third of the project has been completed to date.

One of the newest and most important links in this long-range program is the western approach to the John E. Matthews Bridge over the St. John's River. To cope with the heavy traffic anticipated on this approach, two courses of hot-mix Texaco Asphaltic Concrete, with a compacted thickness of two inches, are being laid over a limerock foundation ten to twelve inches thick. Up to the present time, more than 500,000 square yards of Jacksonville's expressway system have been paved with Texaco Asphaltic Concrete on either a limerock or a shell foundation.

For less heavily traveled sections of the system, sand bituminous construction of the road-mix type has been employed, using Texaco Cutback Asphalt as binder.

From Florida to New England and west to the Rockies, road builders have been relying on the dependable performance of Texaco Asphalt products for 50 years. Refined exclusively from carefully selected crudes, these Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils supply answers to every road and street need, from heavy-duty pavements to inexpensive, waterproof mats.

Two booklets, which supply helpful information about the various types of Asphalt construction, can be obtained by interested road builders without obligation by writing our nearest office.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York 17
Boston 16 (20 Providence St.) • **Chicago 4** (332 So. Michigan Ave.) • **Houston 1** (720 San Jacinto St.)
Jacksonville 2 (Hildebrandt Bldg.) • **Denver 1** (P. O. Box 2100) • **Philadelphia 2** (1411 Walnut St.)
Richmond 19, Va. (Mutual Assurance Society Bldg.) • **Minneapolis 3** (Groveland Ave.-Clifton Pl.)

TEXACO
REG. T. M.

TEXACO ASPHALT

Contractors and Engineers
the BIG magazine of construction

July, 1953

Foreign Competition on Contracts

Our government has long professed, and generally followed, an attitude of helping other countries with their economic problems. The purpose of our economic foreign policy is to get these nations on their own feet with the necessary financial aid, with the idea that, once so stabilized, they will be able to hold their own. The U. S. taxpayers have, in the main, accepted this as a reasonable procedure that will be of benefit not only to the foreign countries involved but, ultimately, to us.

It must be very disconcerting to them, therefore, when the government rejects bids by foreign companies that seek to compete with our own manufacturers and contractors in the construction industry—and to earn the money that we are now giving them in loans and outright grants.

A case in point was the recent rejection of a British firm's low bid to furnish generators and transformers for Chief Joseph Dam on the Columbia River in Washington. A vague reference to specifications and a hint of technical inaccuracy in the submission of the bid was the reason advanced for the bid rejection.

Since then, however, the government apparently has reconsidered its stand. The Corps of Engineers, U. S. Army, and the Bureau of Reclamation have awarded major contracts respectively to a British and a Swiss company for electrical equipment to be installed at McNary Dam and Palisades Dam—two projects under construction in the Northwest. In the interests of fair and free trade, this is the only course the government could logically follow. Otherwise it could justifiably be accused of rendering only lip service to the need for Western European countries to sell goods and services to this country.

Encouraged, no doubt, by this about-face, other British contractors are showing interest in a proposed vehicular bridge-tunnel across Hampton Roads, Va. For some time the Virginia Department of Highways has been considering the construction of a 4-mile facility that would link Norfolk with the Newport News area. Competition from foreign contractors would not be as unusual as one might think.

Shortly after the turn of the century, the great era of tunnel construction in this country was just getting under way with the building of railroad tubes under the East and Hudson Rivers in New York City. British contractors and engineers had a leading part in this work for the Pennsylvania Railroad since American construction firms, up to that time, had little or no experience in building subaqueous tunnels. The British companies' earlier experience with tubes under the Thames had provided them with valuable knowledge of working with shields and pneumatic pressure. American contractors speedily caught up with and soon passed the British with improved techniques and equipment. It might be that now it is our turn again to learn from others how to build something better and at a lower cost. If so, we cannot afford to turn our back on healthy competition, even if it is from across the seas.

Illustration at the top of the page shows an artist's conception of a proposed tunnel-bridge across four-mile-wide Hampton Roads, Va. It would link the Newport News area (left) with Norfolk (right). The tunnel under the main channel would be approximately 7,200 feet long between portals. Ferries now cross the water barrier on both sides of the proposed Virginia Highway Department project.

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NEWS AND VIEWS

of the Construction Industry — Boom Year, New Projects, Competition

Despite a considerable decrease in the number of Federal contracts awarded during the first half of the year, **construction activity** across the nation is running about 10 per cent ahead of 1952. With commercial building and private mass housing leading the way, there is little doubt that the boom will continue through the year.

Two big projects that will help broaden the base of the boom emerged recently from the dream stage as financial transactions were completed. At an interest cost of 3.435 per cent, toll revenue bonds were sold by the Delaware River Port Authority to finance a $100,000,000 suspension bridge between Philadelphia, Pa., and Gloucester City, N. J.

Other good news for **construction men Thruway** Authority borrowed $125,000,000 in the public market on bonds with an interest cost of about 2.64 per cent. These bonds, which are secured through the full faith and credit of the state, as well as toll revenues, will provide part of the half billion required to complete the 427-mile expressway.

Other good news for construction men comes from the fields of aviation and education. Legislation to aid or facilitate the financing of airport construction has been enacted this year in five states, and is pending in seven others. At least a dozen states have approved legislation for financing new schools.

But getting new construction under way is not always smooth sailing. When New York City contractors moved in recently to begin work on the New Jersey half of **Lincoln Tunnel's third tube,** they were blocked by three patrolmen of the Township of Weehawken, N.J. Local officials had not been satisfied with financial adjustments made by the Port of New York Authority and called upon the Township police to bar the pick and shovel onslaught. The Authority, however, counterattacked with a temporary court order permitting work to begin on the 6-month job of sinking the shaft for the $90,000,000 tube. Port officials are striving for a quick settlement.

On the opposite side of the country in northwest Oregon, another group is attempting to **block construction work**—but this time the issue is the Chinook salmon. The Yakima Tribe of Indians, past masters at spearing leaping salmon, are attempting to relocate the **Dalles Dam** about 12 miles up the Columbia River, from the present construction site. Their spokesmen assert that the new dam, designed to be one of the three greatest power producers in the world, would eliminate Celilo Falls and ruin the fishing. Yakima objections, however, are not expected to alter Corps of Engineers, U. S. Army, plans because of money already spent on the project, and also because of the power and navigation losses that would result from the proposed relocation.

Navigation was also in the news recently when William White, president of the New York Central Railroad, declared that a **St. Lawrence Seaway** with a 27-foot draft would accommodate only about 8 per cent of American ships. He added that the seaway, if constructed, would carry mostly foreign ships, and would greatly decrease the freight volume on U. S. railroads. At any rate, the reluctance of Congressional leaders to consider the bill will probably postpone any action until next year.

In other parts of the country, however, **construction is getting the green light.** After a series of long delays, the Ohio State Turnpike Commission can now go ahead and pave the 241-mile expressway with cement concrete. The Ohio Supreme Court has reversed an Appellate Court order directing the Commission to take bids on both cement and asphalt. The decision was based on the court's opinion that the Commission has "wide, discretionary powers in the selection of road-building materials, subject only to the limitation that it act in good faith and not abuse its discretion".

One week earlier, the New Jersey Supreme Court cleared the way for completion of the financing and construction of the 185-mile **Garden State Parkway.** The validity of the State's right to guarantee New Jersey Highway Authority revenue bonds had been challenged by several groups. But the court's majority opinion noted that, in a referendum last November, the voters had overwhelmingly approved the paying of principal and interest from general taxation if tolls were found to be insufficient. The court added that the plan did not violate a constitutional ban on loaning the state's credit. Previously operating under temporary loans from local banks, the Authority is now expected to place the entire route under contract.

Toll roads in many other parts of the country are still popular subjects. In Connecticut, a bill was passed by the legislature authorizing construction of a thruway across the length of the state. State gasoline taxes may be used to amortize the bonds if toll receipts prove insufficient.

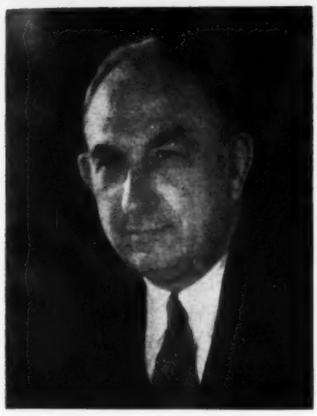
But toll-road support is not always unanimous. Opponents of proposed new toll roads in Oklahoma have formed the Oklahoma Free Roads Association, which will sponsor a drive to petition a referendum on recently enacted legislation authorizing three new toll roads.

Advocates of **free road systems** were heartened recently when Governor McKeldin of Maryland affixed his signature to a bill authorizing the State Roads Commission to proceed with a $568,000,000 road-improvement program. When completed in 12 years, the program will provide Maryland with a completely modern highway network. The money will be acquired by increasing several types of taxes.

Despite all the new construction programs, **competition is getting tougher** and tougher for contractors. And now it looks as if foreign firms are also going to enter the race. In fact, a British electrical manufacturing company recently won a contract to build six transformers for McNary Dam in Oregon. The Atomic Energy Commission has also announced a big foreign contract—Brown Boveri Corp. of Switzerland has been awarded a contract for heavy-duty electrical equipment at the huge atomic explosives plant in Ohio.

Modern housing project under way in Newark, N. J., by the Terminal Construction Co. of Wood-Ridge, N. J.

Catwalks for cable spinning on a Rhine River suspension bridge near Cologne, Germany. *Wide World Photo*



William E. Dougherty, recently elected president of The Moles.

Moles Elect Dougherty

At The Moles' annual meeting in May, Richard E. Dougherty was elected president. Mr. Dougherty, who succeeds David Bonner, vice president of Frederick Snare Corp., 233 Broadway, New York, N. Y., worked with the New York Central System from 1902 to 1951, retiring as active vice president in 1948 and from his advisory role in 1951. He is now in private practice as consulting engineer with the firm of Seelye, Stevenson, Value, & Knecht, 101 Park Ave., New York.

Other officers elected were: George F. Ferris of Raymond Concrete Pile Co., first vice president; William A. Durkin of Walsh Construction Co., second vice president; Theodore M. Avery of Blaw-Knox Co., sergeant-at-arms; Harry T. Immerman of Spencer, White & Prentis, Inc., secretary; and Edward O. Johnson of Arthur A. Johnson Corp., treasurer. All companies are of New York.

The Moles is an association formed 16 years ago as a social club for tunneling and heavy construction men. Its membership numbers over 400 internationally prominent engineers.

Naval Architect Retires

Howard C. Sullivan, head architect of the Bureau of Yards & Docks, U. S. Navy, Washington 25, D. C., has retired after 40 years of service.

Mr. Sullivan has won a number of architectural awards, including competition for the design of the Naval Medical Center in Bethesda, Md., and competitions of the Association of Federal Architects. He is an expert on hospital and air-station design, was a pioneer in the design and development of the offset runway system, and is said to be the first Government architect to adopt modern functional design.

Massman Promotions

John E. Davidson has been appointed executive vice president of Massman Construction Co., Kansas City, Mo. Mr. Davidson, who has had extensive experience in the field of atomic energy, was promoted from the post of vice president of the company.

The company further announced the promotion of two general field superintendents, George E. Owens and William H. O'Donley, to vice president.

Mobile Hydraulic Crane

A lightweight self-propelled crane mounted on a wheel-tractor has a road speed of 15 mph. The unit is hydraulically powered for turntable rotation, boom elevation, raising and lowering of cable and hook, and extension and retraction of the boom. Steering is hydraulic. The crane is an Austin-Western adaptation of a machine originally designed for use by the U. S. Navy.

The boom rotates 360 degrees and there is a 24-foot horizontal reach from the center of rotation. The vertical lift from ground level to hook is 24 feet. The crane's over-all height is 9 feet and width is 8 feet.

According to the manufacturer, the unit negotiates grades up to 20 per cent under full load.

The company is now planning truck-mounted applications of the crane and a complete line of attachments—clamshells, fork lifts, etc.

For further information write to Austin-Western Co., 601 Farnsworth Ave., Aurora, Ill., or use the Request Card at page 18. Circle 441.

The Austin-Western tractor-mounted hydraulic crane.

Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

THE pattern of these clean-cut, *deep-gripping* treads shows how Goodyear's famous Sure-Grip off-the-road tires provide sure-footed traction that keeps loads rolling on schedule.

It takes long experience to build tires that can stand up to any job—and save you time and money—but Goodyear has what it takes. Goodyear has built over 575 MILLION pneumatic vehicle tires—more tires for more uses than anyone else on earth—and out of that tremendous practical experience come the continuous cost-saving improvements, the rugged *working* qualities, that can mean so much to you. So pin your faith on Goodyears for every wheel on the job—and see what your equipment can really do! Goodyear, Truck Tire Department, Akron 16, Ohio.

You can't beat the SURE-GRIP for drive-wheel traction on graders and pans.

You can't beat the HARD ROCK LUG for rocky terrain and all kinds of tire-killing work.

You can't beat the ALL-WEATHER for flotation and rugged endurance on all free-rolling wheels.

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND

We think you'll like THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

The new high-lift model of the Baker-Lull Shoveloader in action.

New High-Lift Model Of Front-End Loader

A high-lift model of the Baker-Lull Shoveloader for loading hoppers and trucks is announced. Lifting height of the new model is 16 feet and dumping height 14½ feet for loads up to 6,000 pounds.

Four accessory tools available include a coal and snow bucket, a loose-material bucket, a regular material bucket, and a crane hook.

The High-Lift Shoveloader is mounted on four national makes of wheel-type tractors: Case, Minneapolis-Moline, Sheppard, and Oliver. A feature of the loader is that the operator can shake the bucket while it is in dumping position.

All actuating parts of the equipment are ahead of the operator for safety.

For further information write to Baker-Lull Corp., Department KP, 314 W. 90th St., Minneapolis 20, Minn., or use the Request Card at page 18. Circle No. 397.

Moses Wins $25,000 in Highway-Essay Contest

Robert Moses, construction coordinator and parks commissioner of New York, N. Y., has received the first national award of $25,000 in the General Motors Better Highways Contest.

Competing with highway specialists and laymen from every part of the country, Mr. Moses' essay of less than 10,000 words on "How to Plan and Pay for the Safe and Adequate Highways We Need" was selected by the following five judges: Ned H. Dearborn, president of the National Safety Council; Thomas H. MacDonald, former commissioner of the Federal Bureau of Public Roads; Curtis W. McGraw, board chairman of the McGraw-Hill Publishing Co.; Dr. Robert Sproul, president of the University of California; and Bertram D. Tallamy, superintendent of the New York State Department of Public Works and chairman of the New York Thruway Authority.

Mr. Moses, in his essay, urges the spending of $50 billion over the next ten-year period to narrow the discrepancy between today's car and yesterday's road. He suggests that part of the money be raised by doubling the existing program of Federal highway aid to states. This could be done by increasing the Federal gasoline tax from two to three cents a gallon and segregating the proceeds, together with the current Federal tax of six cents a gallon on oil, for highway aid. He further suggests a number of measures for reducing traffic congestion in metropolitan areas, including fringe parking areas, "wholesale metering", and a requirement that trucks load and unload at night.

Brig. Gen. Lacey V. Murrow, director of competitive transportation for the Association of American Railroads, won the second national award of $10,000, while Claude A. Rothrock, chief of the planning division in the West Virginia Road Commission, received the third place award of $5,000.

New Engine for Roller

According to the Huber Mfg. Co., 202 N. Greenwood St., Marion, Ohio, its 8 to 12 and 10 to 14-ton tandem rollers are now available with the Caterpillar Model D-315 diesel engine. The engine develops 66 hp at governed speed. It has a 4½-inch bore, a 5½-inch stroke, and 350-cubic-inch displacement.

The company will also continue to furnish its rollers with Hercules gasoline and diesel engines that it has used in the past.

For further information write to the company, or use the Request Card at page 18. Circle No. 432.

Help train the engineers needed in underdeveloped countries. Your contribution to the CARE Book Fund, 20 Broad St., New York 5, N. Y., can provide new American engineering books for foreign universities and libraries.

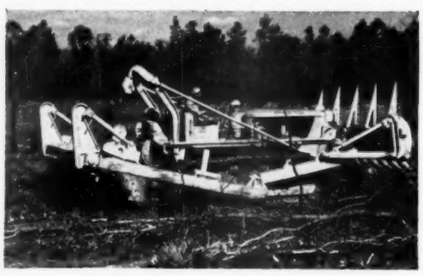
FLECO ROOT CUTTER FOR BELOW SURFACE CUTTING

THE NEW FLECO ROOT CUTTER is now available for the "Caterpillar" D8 and D7 Tractors. Many months of severe field testing have proven the Root Cutter and the initial units delivered to users are doing an excellent job on land clearing operations requiring growth to be cut below ground level. The undercut is adjustable to various depths in accordance with the soil and type of growth.

The two rolling coulters are mounted ahead of the two vertical standards for cutting a clean path for the standards and leaving a minimum furrow. In some applications, the brush and trees are left on the site to rot and return to the soil after undercutting. On other applications the site is raked after undercutting, thereby increasing the efficiency of the raking operation.

By using the Fleco Rock Rake, the Root Rake or the Brush Rake on the bulldozer arrangement mounted on the tractor, the debris and small trees are pushed down in symmetrical fashion; thus promoting a more uniform cut by the Root Cutter. The Rake is also used for subsequent raking and piling.

Your Fleco "Caterpillar" Dealer can serve all your needs for heavy duty land clearing equipment. Go in and see him today.



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STUMPERS • BRUSH RAKES
TREE CUTTERS • ROOT CUTTERS
ROOT RAKES • TREEDOZERS
UNDERCUTTERS • ROCK RAKES

FLECO CORPORATION, JACKSONVILLE, FLORIDA

Names in the News

Charles B. Spencer, Egleston Medal winner.

Spencer Receives Award

The Egleston Medal, top honor of Columbia University's Engineering Alumni Association, has been presented to Charles B. Spencer, president of the engineering firm Spencer, White & Prentis, New York, N. Y.

The award, presented annually to a Columbia engineering graduate on the basis of outstanding engineering achievement, is named in memory of Thomas Egleston, founder and first dean of the Columbia School of Mines, forerunner of the present Engineering School.

Mr. Spencer, a 1910 graduate of Columbia, is president of Columbia's Society of Older Graduates and of the General Contractors' Association.

N. J. Highway Authority Appoints Frank Mathews

Former Deputy Attorney General Frank A. Mathews, Jr., has been named chief condemnation counsel for the New Jersey Highway Authority.

Mr. Mathews, who has 15 years' experience in this field, will represent the Authority in all litigation pertaining to property acquisition for the Garden State Parkway. Mr. Mathews served as district judge in Burlington County, N. J., from 1929 to 1933, and in the U. S. House of Representatives from 1945 to 1949 in the 79th and 80th Congress.

Sprague & Henwood Personnel Changes

After 30 years service as head of Sprague & Henwood, Inc., Scranton, Pa., drilling contractor and manufacturer, James A. Ross has been made chairman of the board. Adrian E. Ross, formerly assistant to the president and chief engineer, has been elected president of the company, while William J. Schank, previously vice president, has been appointed senior vice president and general manager.

A handy guide for minimum safe distance in following a car—under good driving conditions—is your speed. If you are driving 30 miles an hour, keep three car lengths behind; 40 miles an hour, four car lengths; 50 miles an hour, five car lengths.

Reese Wins CRSI Award

Raymond C. Reese, a Toledo, Ohio, structural engineer, and author in the field of reinforced-concrete design, has been honored with the 1953 Award of the Concrete Reinforcing Steel Institute for "his contributions to reinforced-concrete construction through design."

The award, consisting of $500 and a certificate of award, is given for research contributing to the advancement of reinforced concrete, outstanding contributions to the theory of reinforced-concrete design, or improvements to reinforced-concrete construction practices.

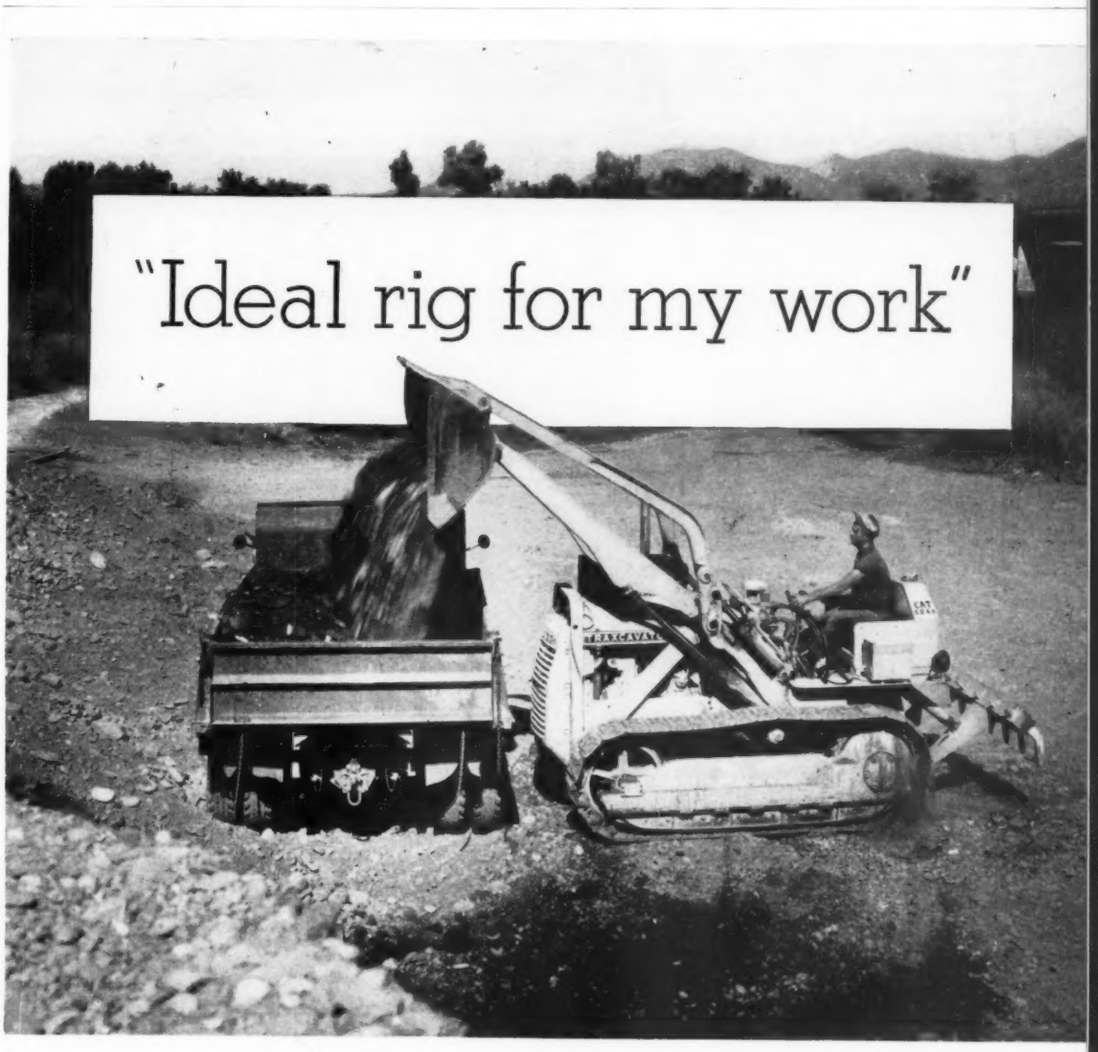
Mr. Reese is co-author of "Introduction to Reinforced Concrete Design" with Professor Hale Sutherland, and author of "C.R.S.I. Design Handbook".

Pennsylvania Wins Award

The National Safety Council Award of Honor was presented to the Pennsylvania Department of Highways for the second consecutive year at a ceremony in May. The State Department of Highways was honored for its low average for 1952 in accident frequency and severity, respectively 68 and 80 per cent lower than the national average.

CMA Re-Elects Dillon

At the Construction Men's Association annual meeting James H. Dillon was re-elected president for the sixth consecutive year. The Association is a mutual welfare organization of construction specialists and technicians who work on projects in foreign countries for American construction firms.



"I wanted a loader for three or four years," says B. C. Foster, contractor, of Redding, Calif., "and I talked to everybody I knew with various rigs. The answer every time was, 'Buy a Caterpillar machine.' I've certainly had good going with my Cat* HT4 Shovel. Its versatility and easy handling make it an ideal rig for my work."

Mr. Foster's Caterpillar 1¼-yard HT4 Shovel handles materials, does precise grading and excavating, and general contracting work. In the photograph, taken at a gravel plant near Redding, note the scarifier, for ripping up pavement on street contracting jobs, mounted on the rear of this versatile machine.

The Caterpillar HT4 Shovel is engineered to take the stresses of a multitude of jobs. The girder-type frame is mounted low and close to the carrier rollers to keep the load off the transmission housing and track frames. A spacer bar between the lift arms keeps the bucket level, and prevents bending and twisting of the bucket control arms and bucket hinge pins.

Your Caterpillar Dealer—who gives fast, skilled service on the equipment he sells—will gladly demonstrate the Cat Shovel that fits your needs. Ask him to *prove* that a fast-operating, clean-dumping, soundly-engineered Cat Shovel is the "ideal rig" for you, too.

Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

LG20.51
C763

Concrete-Block Maker

A new concrete-block machine produces from 400 to 500 standard 8 x 8 x 16-inch blocks per hour and requires only one man to remove and rack the blocks. The Fleming FMC-400 is hydraulic and uses no compressed air. It employs five motors, totaling 11 hp, and has solenoid valves.

All masonry is produced with one set of plain steel pallets, either 18 x 18 inches or 18 x 22 inches. The operator may adapt the machine to the moisture content of the concrete, as well as to the various types of aggregate.

Four contact points on each side of the head-pressure attachment must contact all corresponding contacts on the other side before the micro-switches will operate. This feature controls the height of the blocks to within 1/64 inch.

The off-bearer is actuated by a chain-driven motor and operates by fingertip control. Pallets may be received at either side of the machine from a roller-type conveyor.

For further information write to Fleming Mfg. Co., 84 Fleming Ave., Cuba, Mo., or use the Request Card at page 18. Circle No. 399.

Overdrive for Tractor Increases Top Speed

An overdrive for the Caterpillar DW20 4-wheeled tractor gives it a top speed of up to 34 mph. On tractors with the 15.75 to 1 final drive reduction, the maximum speed is increased 8 mph over similar units without overdrive. Tractors with the 21 to 1 final drive reduction have increased top speeds up to 25 mph with the new overdrive. Combined with the present standard transmission, the overdrive gives a range of ten speeds forward and two in reverse.

The overdrive is now available as an attachment on new machines coming from the factory or for installation on units now operating in the field. It is mounted between the engine and transmission and is controlled by a manually operated shift lever next to the regular gear-shift lever.

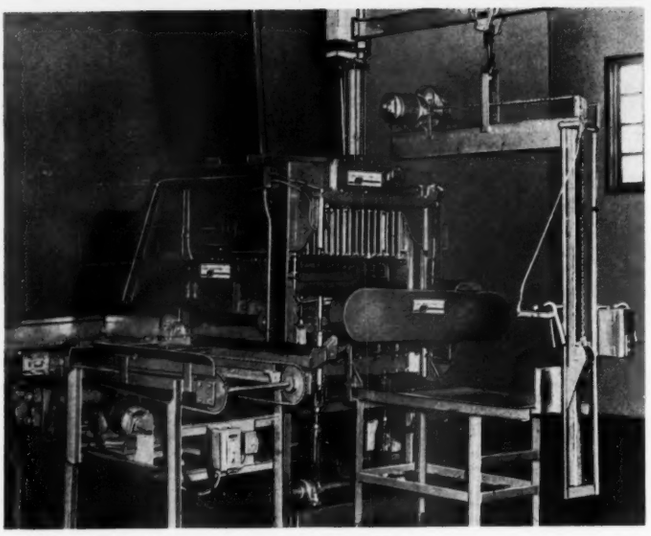
Installation requires a special transmission front cover, a clutch shaft, and a universal joint, all of which are supplied as part of a package the company has available for field installations. The only other modification required on the DW20 is a slot in the floor plate for the overdrive shift lever. The seat does not have to be removed to install the unit.

For further information write to Caterpillar Tractor Co., Peoria 8, Ill., or use the Request Card at page 18. Circle No. 359.

Data on Mechanical Winch

A catalog illustrates the new Stampco Handiwinch, a hand winch made by St. Anthony Machine Products Co., Dept. KP, 2424 E. Franklin Ave., Minneapolis, Minn. The catalog covers specifications, costs, and engineering features of the mechanical winch, and details various construction and industrial applications.

To obtain this literature write to the manufacturer, or use the Request Card at page 18. Circle No. 396.



The Fleming FMC-400 automatic concrete-block machine.

N. Y. Building Congress Re-Elects Dandrow

Newly re-elected president of the New York Building Congress is C. George Dandrow, vice president of Johns-Manville Corp., New York, N. Y., manufacturer of concrete admixtures, pipe coverings, underground conduit, and expansion joints.

Mr. Dandrow has been with Johns-Manville since his graduation and has had experience in many departments. He was made vice president in 1946. Meanwhile he has been busy in industrial affairs and has maintained an active interest in the growth and development of the Massachusetts Institute of Technology, from which he himself graduated in 1922.

Remember—Safety Is No Accident!

TEXACO HELPS MAINTAIN BU
AT FOLSOM DAM—

FOR the real lowdown on how Texaco Lubricants and Texaco Lubrication Engineering Service simplify upkeep, talk to equipment maintenance men. At Folsom Dam for instance, you'll hear reports like these –

"We're getting extra long life from chassis parts in our trucks, tractors, 'dozers and other equipment. *Texaco Marfak* gives the best protection against wear and rust of any lubricant we ever used – stays on the job in spite of heavy loads, jolts, dust and mud.

"Everything said about *Texaco Marfak* also goes for *Texaco Marfak Heavy Duty* in wheel bearings. And we like the fact that no seasonal change is necessary.

TEXACO

TEXACO

The Hopto Digger is now available in a self-propelled model mounted on a crawler tractor.

Digger-Crane-Shovel In Self-Propelled Model

A self-propelled version of the Hopto digger is now made as an integral part of a crawler-tractor unit built by Badger Machine Co., 1122 W. 5th St., Winona, Minn. The tractor on which the digger-crane-shovel is mounted has 8-foot tracks with 17-inch pads to make it suitable for operation on any type of soil, bog, or swamp. A futher feature is that by-pass and relief valves are built into the machine's 1,000-psi Vickers hydraulic system.

The unit has a loading capacity of 40 yards an hour with a ¼-yard bucket. Larger buckets are available for light materials and snow.

The lift of the unit equipped with a crane is 24 feet with a capacity of 3,000 pounds at a 15-foot radius. When equipped with a backhoe, the load clearance is 10 feet, with a shovel bucket 11 feet, and a snow bucket 12 feet. The unit has a 180-degree swing regardless of the type of optional equipment used.

Surface reach is 15 feet and digging depth 12 feet. According to the manufacturer, capacity of the machine is 60 feet of 24-inch trench dug 6 feet deep per hour.

For further information write to the company, or use the Request Card at page 18. Circle No. 401.

Rubarite Will Make Synthetic Rubber

A company which will manufacture and sell synthetic rubber powders for use in asphalt for roads and in other asphalt materials has been formed by the joint owners: Goodyear Tire & Rubber Co., Akron, Ohio; National Lead Co., New York, N. Y.; and Berry Asphalt Co., Chicago, Ill., a subsidiary of Bird & Son, Inc., East Walpole, Mass.

H. B. Pullar, president of Rubarite, Inc.

H. B. Pullar, president of Berry Asphalt Co., is president of the new company; G. B. Coale and H. A. Endres are vice presidents.

During the past few years, Rubarite, a free-flowing unvulcanized synthetic-rubber product, has been used successfully on a number of heavily traveled test roads. Experiments show that use of Rubarite asphalt results in considerably less frost damage to road surfaces. In addition, the new paving material is more immune to heat, less sensitive to variable weather conditions, and will wear longer under the heavy pounding of modern-day traffic.

Headquarters of Rubarite, Inc., are in the Board of Trade Building. Chicago.

Patterson Joins Luria

Emory F. Patterson, a construction engineer who has served many years with Great Lakes Steel Corp., Detroit, Mich., has joined the executive sales staff of Luria Enginering Co., New York, N. Y., and Bethlehem, Pa. The company specializes in the design, fabrication, and construction of standardized industrial steel buildings and airplane hangars.

Mr. Patterson graduated from the Massachusetts Institute of Technology in 1927. He was with Turner Construction Co., New York, N. Y., until 1931, when he joined Great Lakes. While with Great Lakes he was plant manager at Mansfield, Ohio, and Terre Haute, Ind., and eastern division manager of the Stran-Steel Division.

N BUILDING PACE

ntractor: Merritt-Chapman & Scott Corporation
d The Savin Construction Corporation

FOLSOM DAM

Folsom, California — said to be the world's largest earthfill and concrete structure of its kind — is scheduled for completion late in 1954. To meet this date, innumerable pieces of construction equipment must be kept working at top efficiency. Effective lubrication—*Texaco*—is one of the contractor's biggest helps.

"Texaco Track Roll Lubricant is giving us longer-than-ever service from our rollers — and they really take a beating."

Those are just three of the six basic Texaco Lubricants needed to serve all major construction equipment. Ask your Texaco Lubrication Engineer about the Texaco Simplified Lubrication Plan and how it can help you avoid mistakes, save time and money.

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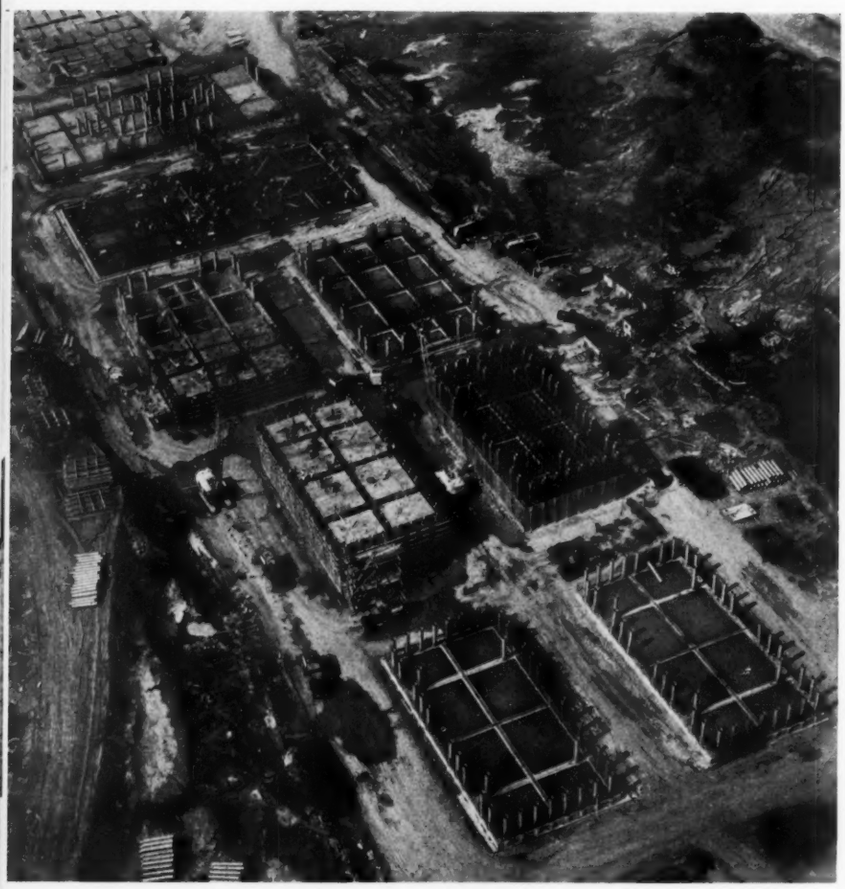
Prefabrication Speeds Concrete Caisson Job

The closeup, above, and the aerial view, below, show all of the 8 concrete caissons in various stages of development. A second-lift concrete pour is underway on the caisson in the center of the aerial photo. The 8 form panels which will be used later for the deck are acting as scaffolds during the wall pour.



By RALPH MONSON, Field Editor

• FABRICATING huge mats of reinforcing in a special setup right on the job site is a major factor in speeding the construction of eight buoyant footing caissons, which will help carry the New York Thruway over the Hudson River between South Nyack and Tarrytown. The gigantic concrete boxes which are being manufactured by Corbetta Construction Co., New York, N. Y., about 10 miles upstream from the bridge site, will be floated into place.

Utilizing the same basin in which the caissons for New York City's Pier 57 were cast last year (see C. & E., July, 1952, pg. 4), Corbetta has set up fabrication and casting yards which make possible pours of up to 900 cubic yards per day, every other day. Under this schedule, the final pour of the 32,000 cubic yards of concrete will be completed August 31, 1953.

In Old Clay Pit

The basin is an abandoned clay pit adjacent to the Hudson River near Haverstraw, N. Y. (See C. & E., Aug., 1951, pg. 9.) The concrete beds on which the caissons are cast lie almost 32 feet below low water. At the south end of the basin lies the steel fabrication yard where reinforcing bars are received in 60-foot lengths, and are cut, bent, and welded together into large mats. At the north end is the form fabrication yard in which all forms are assembled in large sections for quick and accurate erection and convenient re-use.

Between the two fabrication yards are the casting beds on which the eight huge caissons are taking shape. Corbetta's neat red and yellow field offices stand on the east bank of the basin overlooking the entire project.

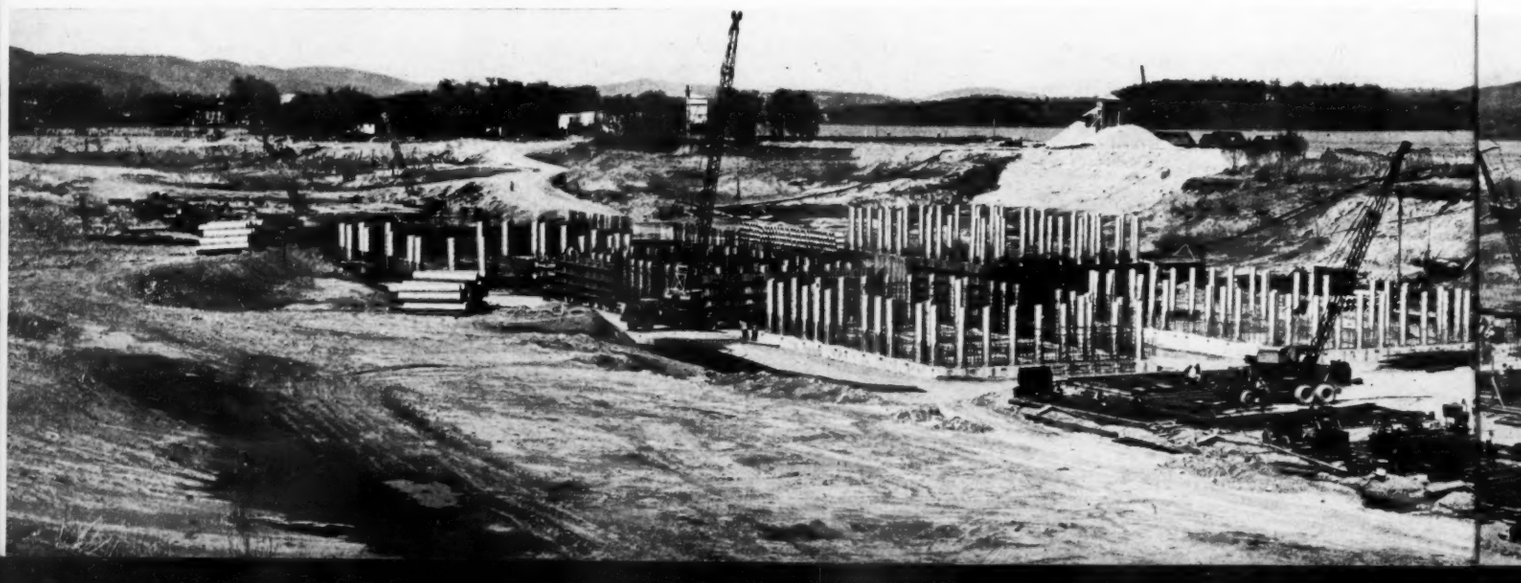
Buoyant Concrete Footings

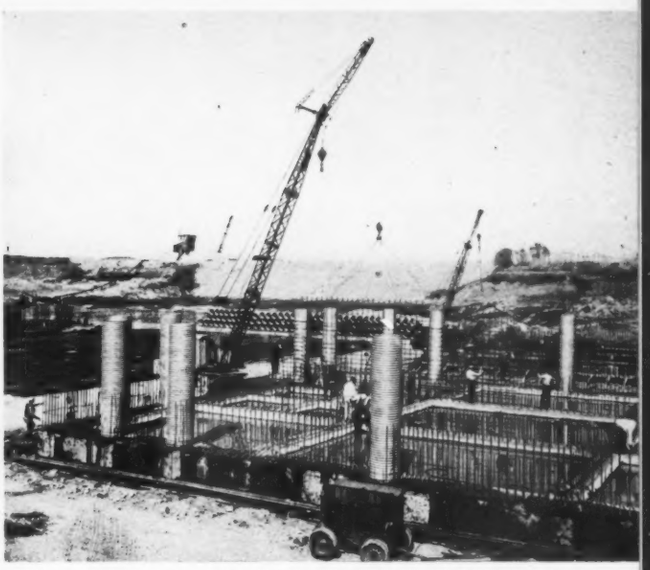
The caissons themselves are unique as bridge supports although they are similar to those used on Pier 57. The watertight concrete structures are buoyant footings which will rest on the relatively soft bottom of the widest portion of the Hudson River known as the Tappan Zee.

(Continued on page 12)

This overall view of the huge project taken from the inside rim of the basin shows the steel reinforcing plant on the right and the concrete caissons under construction at the left. When all of the boxes are built, the basin will be flooded, the light-colored section of the dike near the concrete plant, left, will be opened, and the 8 units will be floated out into the Hudson River and towed 10 miles downstream to the N. Y. Thruway bridge site at Nyack.

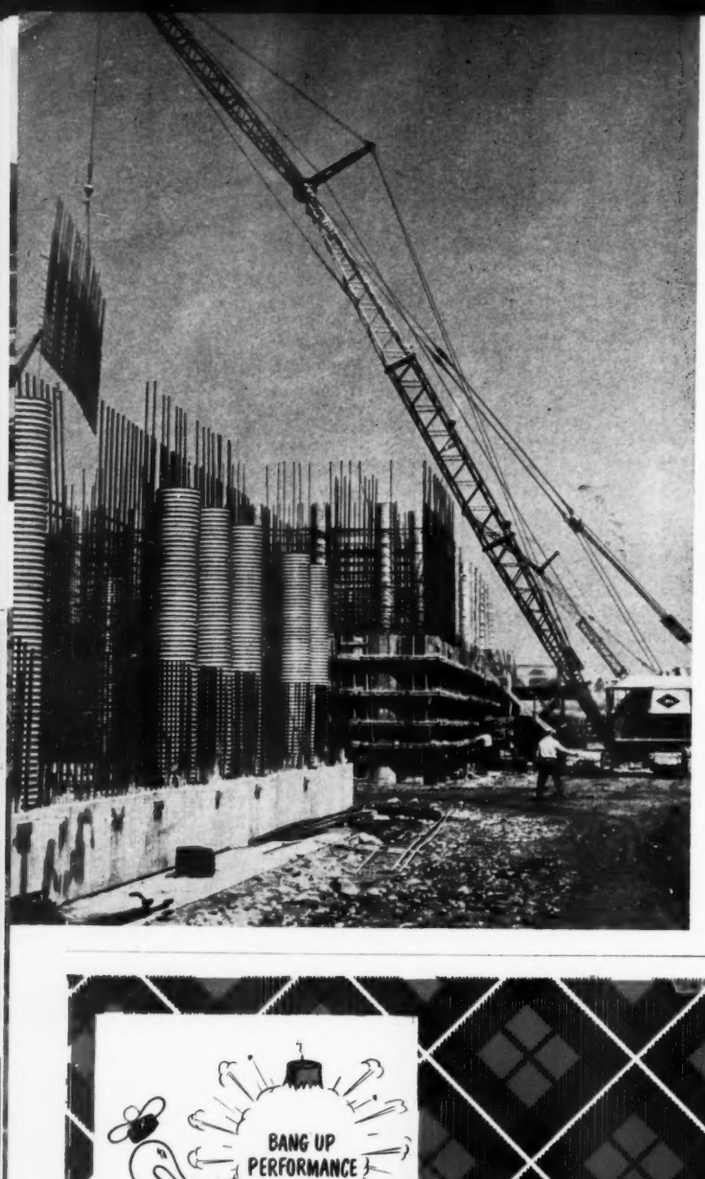
C. & E. Photo





After reinforcing mats are assembled and welded in the jigs, they are stored at one side, left, or loaded directly on trailers. At one of the caissons, right, a Lorain Moto-Crane positions a mat of vertical reinforcing over a line of dowels. Workmen apply fast "blobwelds" to tie the mat to the dowels.

A form panel is removed by this Bay City crane, left, as the caisson walls are wet down. The panel is then carried to an adjacent caisson, right, lowered into the positioning blocks, and secured. The 20-minute procedure is repeated until the complete set of forms is transferred to the other caisson.



A section of prefabricated reinforcing steel is lowered into position by a Lima Model 802 crane.

Workmen use a Klingelhofer bar bender to make hooks on heavy steel reinforcing rods.

Prefabrication Speeds Concrete Caisson Job

(Continued from preceding page)

At this location, bedrock lies from 230 to 300 feet below the water surface, and the engineers considered it uneconomical to support the entire bridge load on piles of that length. The river bottom material is not sufficiently stable to permit spread footings. The buoyant caissons overcome both conditions.

When completed, the boxes will float. At the bridge site, they will be ballasted with water until they settle to a prepared bed on the river bottom. Then, as the bridge piers and superstructure are constructed, ballast will be removed from the caissons until their buoyancy counteracts most of the weight of the structure.

Thus, a large part of the load is actually supported by the water, and only a very few piles are required for stability. Steel H-piles or con-

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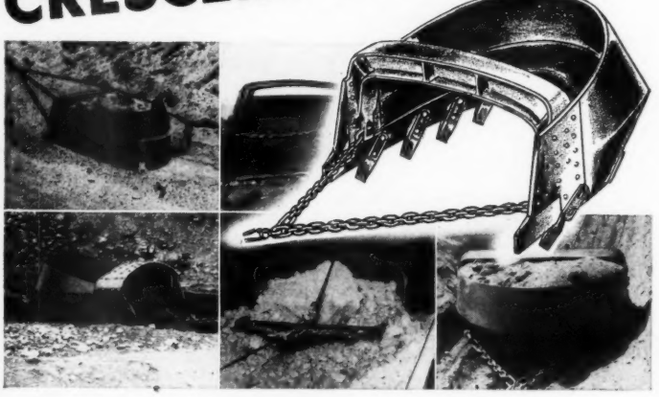

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EARTHMOVING EQUIPMENT SINCE 1909

crete-filled tubular steel piles will be driven through sleeves in the boxes to bedrock and grouted into the sleeves to make them an integral part of the footing.

Piers for the support of the main cantilever-truss spans of 601 feet, 1212 feet, and 601 feet, as well as west approach spans of 250 feet, will be constructed on the caissons after they have been placed. Merritt-Chapman & Scott, New York, N. Y., holds the general contract for pier construction and has sublet the floating caissons to Corbetta. M-C&S will add a lift to the caissons at the bridge site bringing them to a final height of 40 feet.

Before the caissons are placed, the river bottom will be excavated to an elevation of 46 feet below mean low water. A 2-foot blanket of sand followed by 2 feet of gravel will provide the base for the caissons at elevation minus 42. This will leave the tops of the 40-foot-high boxes submerged 2 feet at low water.

Three Types of Boxes

The eight caissons being constructed are of three sizes. The four smaller ones measure 56 x 110 feet in plan and are divided by bulkheads into eight compartments. Exterior walls and some interior walls are nominally 2 feet 10 inches thick, bulging to 3 feet 9 inches at each of the 48 metal sleeves. The base slab is 2 feet 3 inches thick. An intermediate deck slab, 8 inches thick, about 24 feet above the base, completes the enclosure of the sections. Walls extend 6 feet above the intermediate deck slab, with another lift and roof slab to be added after the boxes have been floated to the bridge site. Sleeves are 16-gage corrugated galvanized iron pipe, 25 inches in diameter.

Two intermediate-sized boxes measure 77 feet by 124.5 feet and have outer walls 3 feet 9 inches thick. They are divided into 18 compartments and have 20 metal sleeves 36 inches in diameter. The two large structures measure 110 x 190 feet and have 24 compartments. Sleeves for 53 piles are arranged in exterior and interior walls. Weep holes connect the several cells in each unit and a sump is provided in one compartment for pumping.

When the caissons are completed, the pit will be flooded with river water. Then the dike will be opened and the caissons floated downstream to the bridge site.

Preparing the Basin

Before Corbetta's work began, the dike had to be reconstructed across the opening where the Pier 57 caissons had been floated out. Merritt-Chapman & Scott brought in 50,000 cubic yards of fill material by barge to begin the closure and completed it with 25,000 cubic yards of gravel. With the dike complete, four 10-inch Marlow pumps driven by Waukesha gasoline engines began the 14-day task of dewatering.

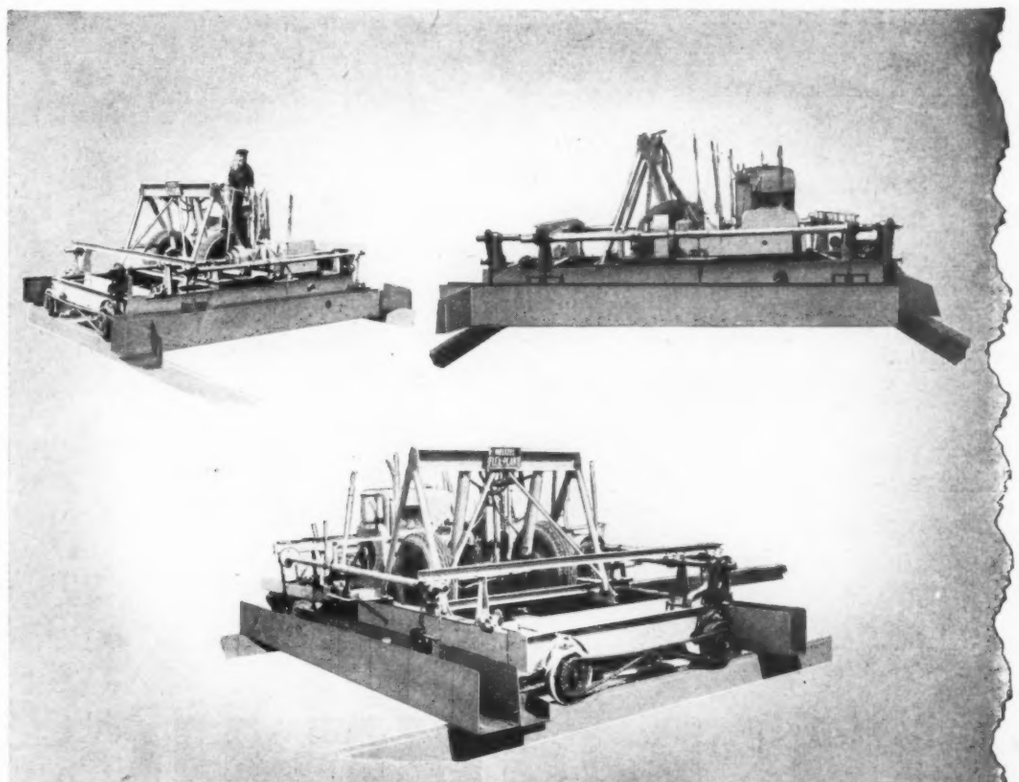
An estimated 350,000 gallons of water were removed to dry up the basin. Three of the pumps were then installed in sumps in the floor of the basin to pump out seepage and rain water. One pump easily handles the seepage, but all three are used in case of heavy rains.

Removal of the water revealed a layer of from 2 inches to a foot of silt covering the casting beds. Cleaning up of this material, too thick to pump and too thin to shovel, looked like a difficult task until the weatherman offered a helping hand. The work was being done in late January and early February, and while the ground in the basin was not frozen, the frost each night consolidated the muck just enough so it could be removed with dozers and scrapers early the following day. In three weeks the muck had been removed and the excavation readied for pouring of extensions to the slabs of the casting beds.

Within the next ten days, the casting beds which had served for the Pier 57 boxes were modified to accommodate the new structures to be built. In the meantime, Corbetta was assembling the equipment for the steel and form fabrication yards

(Continued on next page)

The day following the pour, workmen use high-pressure air and water to wash off surface mortar. Exposed aggregates act as a bond with the next pour.



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Special screeds and screed mounts enable this speedy machine to finish any type surface in the manner specifications call for. Both screeds are mounted outside the frame which permits faster screed changes. Machine is telescopic . . . can be altered to fit any size job in approximately 15 minutes. If you are in the business of building concrete streets, highways or landing strips, you can't afford to overlook this cost-cutting finisher. To get all the facts drop a note on your company letterhead to the **Flexible Road Joint Machine Company, Warren, Ohio,** today.

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Two Ingersoll-Rand 315-cfm compressors supply air to all parts of the job as a Marlow 10-inch pump draws water from the sump and discharges it over the dike.

Prefabrication Speeds Concrete Caisson Job

(Continued from preceding page)

and the crews who were to do the work.

Steel Fabrication

Reinforcing steel is received in carload lots at West Haverstraw, N. Y., directly from the Bethlehem, Pa., mill in stock lengths of approximately 60 feet. A truck crane unloads bundles of bars from freight cars onto hired truck-trailers with 42-foot flat beds which haul the steel to stockpiles at the jobsite. Roads are graded into the basin to permit these and other vehicles to drive in and out.

From the stockpile, bars proceed to the cutting tables where two Doelger & Kirsten rod cutters cut them into the required lengths. Bars are then bent to the required shapes by two Klingelhofer bar benders. One bender normally keeps up with the demands, the second being held in reserve.

Bent and straight bars in the proper length and numbers are then collected at the fabrication beds for assembly into mats. Jigs for aligning the bars in these beds consist of 2 x 2-inch angles with notches in one leg to receive the bars at the proper spacing. The other leg of the angle is simply nailed down to the wooden supports of the bed to hold it in place for the particular mat being fabricated. When it is desired to make another type of mat, the angles are quickly and easily moved to new positions.

Some mats for corner reinforcement of walls form right angles with one leg extending high in the air. These vertical legs are held in place in the jig by cleats on a plywood wall which position the bars.

With all the bars for a particular mat in place, welders move in and electric-weld approximately one-fifth of the bar intersections. These are simple and quickly made "blob-welds" intended only to hold the bars in place during erection and pouring. The mats, however, are very rigid and are easily handled by the cranes.

While the mats are in the jig, spots of yellow paint are placed on bars at strategic points. A survey party accurately locates corresponding points on the casting bed where the mats are to be laid. By positioning the mats so that the yellow marks on the bars are superimposed on the marks on the bed, all bars are immediately and accurately positioned.

Mats Overlap

Mats are fabricated so as to be overlapping, to the extent necessary for bonding the bars. When set in place and accurately positioned, they are electric-welded together to form a rigid structure which stands a great deal of abuse without permitting any bars to be displaced.

Lower mats in base slabs were raised by cranes after being welded together and precast briquettes of 5,000-psi concrete were placed under them to give the proper clearance above the casting bed.

Reinforcing for a wall pour (11½ feet high) of the smaller boxes consists of only 38 mats: one for each corner and one to close each side between the corner sections. These 38 mats can be set in place in a very short time with a crane and are very quickly and accurately positioned and welded to the dowels from the preceding pour.

No tie wires are required; all bars are held rigidly in place; no scaffolding needs to be erected; and every bar in the structure is accurately positioned. Walter Campana, steel superintendent, aptly described the situation when he said, "We are using structural steel methods to place reinforcing."

As with structural steel methods, the hoisting equipment is the back-

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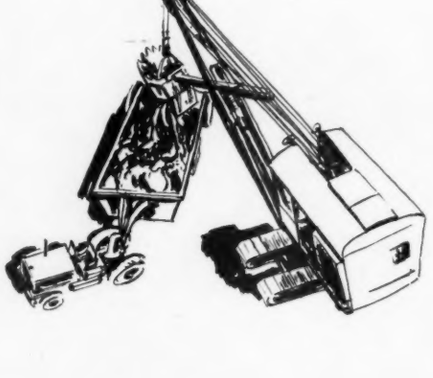

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bone of the operation. On a day when concrete is not being poured, as many as five of the six cranes on the job are working with the steel. On a typical day, two Lima cranes, a 750 and an 802, were handling steel in the fabricating yard with two Lorain Moto-Cranes assisting in loading and placing the mats. A Lima 802 was placing 2-inch-square bars for one of the base slabs.

Early in the work, these cranes were equipped with varying lengths of boom, but later they were all extended to 115 feet to maintain interchangeability of machines on the several types of work.

For the electric-welding operations, 25 gasoline-driven welding generators of several makes and sizes are scattered over the job.

Cranes Place Steel Mats

Completed mats are lifted from the jigs by one of the cranes and hauled on the 42-foot flat-bed semi-trailer to the point of erection. Very cumbersome mats, such as the corner wall panels, are picked from the jig by one of the truck cranes and carried directly to the point of placement in the structure where they are set in place. A 6-line bridle facilitates the handling of these unwieldy units. Bars in these mats are ⅝ inch round to 1¼ inches square with the latter, or No. 11 bars, predominating.

In certain cases where continuous bars in lengths up to 190 feet were required, the large bars, 2 inches and 1¼ inches square, were field-welded using the Thermit process. (See accompanying article on page 88.) These large bars were unloaded from the truck and laid in place by a crane. Moving them into exact positions was a 5-man job since a 60-foot length of 2-inch bar weighs approximately 800 pounds.

Pipe Standards Support Bars

Corbetta employed an ingenious device to hold the several layers of these large bars at the proper vertical spacing. The device consists of two standards and a cross member. The standards are made up of a 2-inch pipe sleeve welded to an 8-inch square base plate. The sleeve supports a vertical 1½-inch pipe in which holes are drilled at the elevations of the several layers of bars.

It was originally planned that ¾-inch bolts through these holes would support the cross member between the two standards. However, at the time the bars were to be placed in the forms, the bolts had not arrived. Searching the job site for a substitute, someone discovered a keg of railroad-track spikes. The spikes fit the holes in the standards and the head held the cross member very well. The order for bolts was canceled and the work was actually expedited because the spikes, in addition to being less costly, are more easily placed.

When a new layer of bars is to be placed, spikes are inserted in the holes, a new cross member—usually a 1½-inch pipe—is placed on the spikes, and the next layer of steel laid in place. This process is repeated until as many as 12 layers of steel are placed.

The dimensions of reinforcing mats are determined by the concrete lifts, each mat providing the reinforcing for the section being poured and the dowels for the succeeding section.

Concrete is placed in five lifts. The first is the base slab plus 11 inches of the walls. The next two lifts are each 11½ feet of wall. The fourth lift is the 8-inch roof slab, and the final pour is the wall projection above the roof slab which varies in height from 4 to 8 feet.

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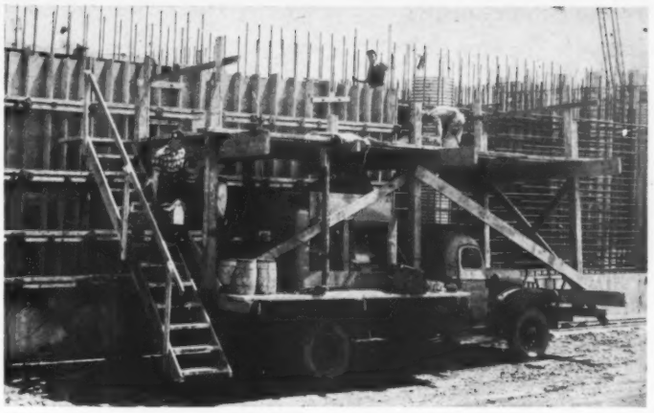

Corbetta's "Fifth Avenue Bus" is used to help set reinforcing, install and remove form accessories, apply curing compound and patch holes left by form ties.

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THEW LORAIN.

Prefabrication Speeds Concrete Caisson Job

(Continued from preceding page)

Form Construction

Prefabricated form panels are designed for efficient re-use with the several concrete lifts. Approximately one-third of the area of the basin at the northern end is set aside for form fabrication and storage.

In general, wall forms consist of ¾-inch Douglas Fir Plyform nailed to 2 x 8 studs spaced a maximum of 16 inches apart. Double 3 x 8 wales are bolted through the entire form. The lower wale is 1 foot from the bottom with succeeding wales spaced 2 feet 3 inches, 3 feet, and 3 feet 6 inches apart.

Sections of these forms 12 feet high and up to 34 feet long are easily transported and placed by the cranes. One set of forms is constructed for each size caisson, and each form is re-used eight times in the pouring sequence.

Overall view of steel prefabrication area on the concrete bridge caisson job near Haverstraw, N. Y.

At the form fabrication yard, two table saws, a Superior and a Beach, both driven by Wisconsin engines, mass-produce many of the form pieces such as wedges, short studs, etc. Plyform is sawed by SkilSaws. Electric power for these saws and for the electric drills which drill holes for bolts and form ties is supplied by two portable gasoline-driven generators, a 7.5-kw Master and a 6-kw Red Devil. These are the only electric-powered tools on the job, all other equipment being operated by gasoline engines.

Form Drawings

Every detail of the construction of the forms is carefully worked out in advance in the field office. Complete and very carefully detailed drawings of each form are supplied to the workmen so that their work becomes practically an assembly job.

The form drawings are prepared in the field office and reproduced by Ditto right on the job. This makes it possible to have copies in the hands of the workmen within a few minutes after completion of a drawing instead of waiting for drawings to be printed.

Each 14 x 17 sheet contains complete details for one form panel, usually a plan and elevation with more information if required. The drawings are very easily read and understood; yet they include every detail necessary to the construction of the panel.

A simple but ingenious device greatly facilitates the quick and accurate positioning of form panels for the outside walls. The form for lifts 1, 2, and 3 contains positioning blocks. These are 2 x 8 blocks about 13 inches long occupying the space between two studs at the top of the form. Instead of being attached tightly to the form these blocks contain anchors projecting into the concrete, which hold them firmly in place on the face of the concrete wall when the form is removed.

The lower side of the form panel has pockets into which these blocks fit when the form is properly positioned. At the location of these

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positioning blocks, three studs are left projecting about 3 feet below the form. Two sets of short wales are secured to the concrete of the previous pour by long threaded bolts.

When the form is to be removed and replaced, it is picked up by a truck crane leaving the positioning blocks in place for the next pour. The form is then carried by the crane to its new location where the panel is positioned on the blocks left there in the previous pour. The short wales are then clamped over the long studs and the crane is freed. The panels are then plumbed and trued by hand with the assistance of the surveyors. When visited by CONTRACTORS AND ENGINEERS, form panels were being removed and reset in less than 20 minutes by a small crew of men using a Bay City 190T truck crane.

On the 11½-foot wall lifts, Richmond 12,000-pound form ties are used. With the unusually strong and rigid form panels, these heavy ties are spaced 4 feet apart at the bottom and 8 feet at the top of the form.

Inside corners of the compartments are all chamfered. In building the inside wall forms, the panels for the sides are constructed so as to leave a gap of about 2 inches when they are assembled. This gap is closed by placing an 8-inch-wide strip of 14-gage metal over it and nailing the strip lightly to both forms. This eliminates all interlocking or binding of these forms at the corners and greatly facilitates their removal.

Fifth Avenue Bus

With form panels and reinforcing mats being handled by cranes, there is little necessity for scaffolding. However, some sort of scaffold is needed at times for several purposes. To meet these conditions, the contractor devised what he termed the "Fifth Avenue Bus". An International flat-bed truck was fitted out with a double-deck platform which was later increased to three decks for lift 5.

Parked close to the walls, the "Fifth Avenue Bus" serves as scaffold for a number of uses. It provides the platform for setting reinforcing mats, installing and removing form hardware, applying curing compound to walls after forms are stripped, and patching holes left by the form ties.

Some scaffolding is also required inside the cells of the caissons for concrete-pouring operations as well as the purposes enumerated above. Realizing that forms would be required for the underside of the 8-inch roof slab, Corbetta built these forms and used them for the inside scaffold.

The form for each compartment is a single rigid panel. The ⅝-inch plywood floor is nailed to 3 x 4 joists which are supported by 4 x 6 stringers stiffened with a strongback. The form is securely bolted and nailed together.

Not only is this a safe and sturdy scaffold, it is an extremely inexpensive one, since the entire form had to be constructed for the intermediate deck slab. A further advantage is that it can be reset at a new level in about 15 minutes.

Stringers are left longer than the span of the opening to support the form while it is used as a working scaffold. These are cut to proper length to fit inside the cells when the panel becomes the form for the roof pour. A single vertical support in the center of the cell takes out all spring and provides a very solid working platform.

Near each corner of the panel, a small square of plywood is left loose so it can be easily removed, exposing one of the stringers. When the platform is placed and when it is raised for succeeding lifts, cables are strung around these stringers at the four corners and a crane raises the panel.

When the roof slab is poured, this form will be entirely dismantled and removed in pieces through the manhole which is left in the roof of each cell.

With these and many other job-made devices and with a well-planned program and well-organized crew, it is possible to make some type of pour every other day. Wall pours average about 600 cubic yards, but as much as 900 yards have been placed in a day in a base slab.

Concrete Plant

Concrete is batched in a plant set up adjacent to the site by Colonial Sand & Stone Co., New York, N. Y., and is delivered in twelve 5-cubic-yard Jaeger mixers mounted on Mack trucks.

(*Continued on next page*)

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Prefabrication Speeds Concrete Caisson Job

(Continued from preceding page)

The batching plant is set up in two sections. The section handling the aggregates and water is located at the river's edge with the cement plant about 100 yards away.

The aggregates are received by barge from Colonial's North Shore plant on Long Island, N. Y. A Northwest crane with clamshell bucket handles aggregates from barge to stockpile and also charges the hoppers of the batching plant. The plant contains a 3-compartment Butler bin, two compartments being used for gravel and one for sand. Aggregates discharge into a weighing hopper of 30,000-pound capacity, and thence into the truck-mixers.

Water, which is taken from the municipal system, is measured volumetrically and added at this plant together with a measured amount of Darex air-entraining agent. The Darex is measured manually in a graduate and poured into a funnel connected to the discharge line of the water tank.

Concrete production at the site is supervised by Madigan-Hyland, consulting engineers for the project. A laboratory is located at the batching plant, where field crews control each operation from batching to placement in the forms. Frequent checks are made for determination of slump and air-entrainment. Cylinders are filled at regular intervals, and tested after required hardening for compressive strength.

When the transit-mix trucks have been loaded with aggregates and water, they proceed to the cement plant. The proper cement quantity for the batch is weighed into the mixers together with approximately 3 pounds of Plastiment admixture.

Type II bulk cement, Lehigh and Lone Star, is received by rail at West Haverstraw in bottom-dump hopper cars. A screw conveyor transfers the cement to a covered truck which dumps into a receiving hopper at the plant. A screw conveyor at the bottom of the hopper feeds the cement into a bucket elevator which raises it to the storage bin. The bin, with a capacity of 300 barrels, discharges into the scale hopper.

Placing Concrete

Mixing is started as soon as the truck-mixers arrive at the point of deposit. Here the truck-mixers discharge 2½ to 3½-inch slump concrete into buckets which are hoisted by cranes into pouring position over the forms. Two 1½-cubic-yard Insley laydown buckets and two Wiley 1¾-cubic-yard bottom-dump buckets are used. All transit-mix trucks used on the work are carefully inspected by Madigan-Hyland engineers for worn blades or other faults, and only those which meet their approval are permitted.

Mall gasoline-driven vibrators assist in working the concrete around the maze of reinforcing.

Upon completion of the pour the top surfaces which will form the horizontal construction joints are treated with Sika RFC to slow up setting of the cement in the thin top laitance area. The retarder is applied to the freshly poured concrete by brush.

The day following the pour, these surfaces are washed with high-pressure air and water which removes much of the mortar and exposes the coarse aggregate, providing a rough surface to bond with the next pour. A layer of grout is first applied to this surface before the concrete is poured. No keyway or any other device is required to obtain watertightness at these joints.

Pipes carrying high-pressure air and water surround all the casting beds. Water pipes are connected to the municipal water system where approximately 90 pounds of pressure are available. Two Ingersoll-Rand 315-foot compressors supply air. Compressed air is carried in 3-inch lines, and water in 2-inch lines. Both have outlets spaced about 50 feet apart around the periphery of each casting bed. Outlets are all equipped with snap couplings for quick attachment and detachment of hoses.

For cleaning the construction joint surfaces, hoses are run from both air and water lines to a common nozzle.

Curing

Newly poured concrete is kept constantly wet for curing. Base slabs which are surrounded by an 11-inch-high wall are simply ponded. Exposed tops of wall pours are constantly sprayed for seven days using a perforated 3-tube plastic hose designed for lawn sprinkling.

Wall forms are removed three days after the pour and the exposed faces are immediately wetted down using a hose connected to the water system. As soon as possible thereafter, a coating of Sika-Seal concrete-curing compound is applied to the surface. The curing compound contains 4 pounds to the gallon of aluminum paste which serves to re-

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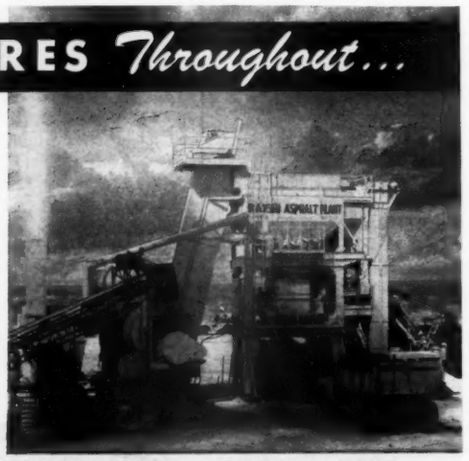

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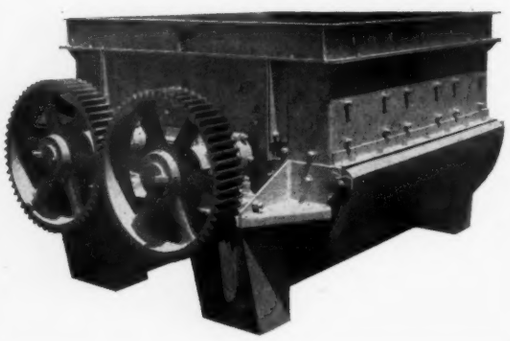

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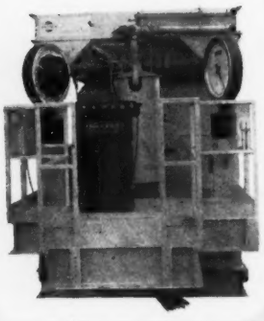

Coupled with the MADSEN 440 Twin-Shaft Pug Mill is the high-speed, convenient control arrangement (shown in the photo at the left) which gives the Model 481 Plant the fastest weighing, charging, mixing and discharging cycle of any batch type asphalt plant on the market. The easier operating controls reduce operator fatigue and increase daily production. MADSEN'S 6-second asphalt pressure injection puts the asphalt into the mixer quicker than any other known method . . . distributes the asphalt more evenly in the mill to take maximum advantage of the paddle action.

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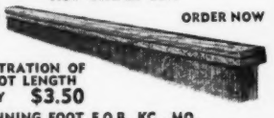

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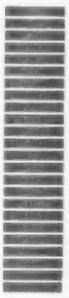

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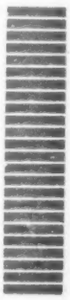

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Contractors and Engineers - Request Card - July '53

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flect radiated heat from the surfaces exposed to the sun, thus maintaining nearly constant temperatures throughout the structure.

Construction joints in the completed structure are tested as to their impermeability before being approved. To make this test, a pair of beams are attached to the outside of the wall and sealed with a rubber gasket. When filled with water, this provides a water-column which will produce pressures similar to those to which the completed structure will be subjected.

In order to be assured that the completed structures will not be bonded to the base slabs, the contractor first applied two heavy coats of paraffin-base curing compound to these slabs. This left a relatively thick coating of wax which was not appreciably damaged during the placing of the reinforcing mats and other operations which preceded the concrete pouring.

To produce the 5,000-psi watertight concrete demanded for these structures, the following mix (quantities are for one cubic yard of concrete) is specified:

Sand	1,145 lbs.
Gravel	2,000 lbs.
Water	30.7 gals.
Cement	565 lbs.
Darex	3 ounces
Plastiment	3 to 6 lbs.

Amounts of admixtures and water are adjusted to maintain 4 to 5 per cent entrained air and a slump of 3 to 4½ inches.

Sand and gravel are graded to the following specifications

Screen size Sand	Per cent passing
4	95–100
8	85–95
16	65–85
30	40–60
50	10–25
100	2–8

Gravel	Per cent passing
1½ in.	100
1 in.	95–100
¾ in.	60–80
½ in.	30–50
⅜ in.	15–30
No. 4	0–10

Personnel

At the time the project was visited by CONTRACTORS AND ENGINEERS 182 men were being employed. This number was expected to be increased to a peak of 250 to 300.

Project superintendent for Corbetta is Olav Olsen; project engineer, George Coneva; steel superintendent, Walter Campana; master mechanic, Nelson Smith. Over-all supervisor is Charles Prokop, vice president of the firm. Theodore Charvat is the "gadget-man" responsible for many of the ingenious devices on the job.

Corbetta Construction Co.'s top men on the concrete caisson job are George Coneva, project engineer, and Olav Olsen, superintendent.

Capt. Emil H. Praeger, of Madigan-Hyland, is the designer for the Tappan Zee Bridge in its entirety, including this portion of the bridge project. Cornelius R. Barrett is resident engineer for Madigan-Hyland at the caisson construction site.

The bridge is a part of the New York State Thruway and is being financed by bonds backed by state credit. Tolls collected from users of the thruway will repay the bonds. Bertram T. Tallamy is chairman of the New York State Thruway Authority.

Colorado Fuel Names Engineering Director

William Brill, who has served as chief engineer for the Colorado Fuel & Iron Corp.'s Pueblo, Colo., plant since 1950, has been appointed director of engineering for the company.

In his new position Mr. Brill will advise and consult with engineering staffs located in various CF&I properties throughout the country. Prior to his appointment as chief engineer at Pueblo he served as assistant chief engineer, and before that as chief draftsman for the company.

Wheel Meters Distance

A new device that measures linear distances through a rubber-tired wheel that runs on the ground is shown in literature from Rota-Meter Mfg. Co., 8814 San Fernando, Dallas, Texas. Each complete revolution of the wheel measures exactly 3 feet. As the meter rolls off distances, it records the total on a visual counter on the handle.

A pad holder built on the handle enables the operator to plot the tract and jot down distances while measuring.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 446.

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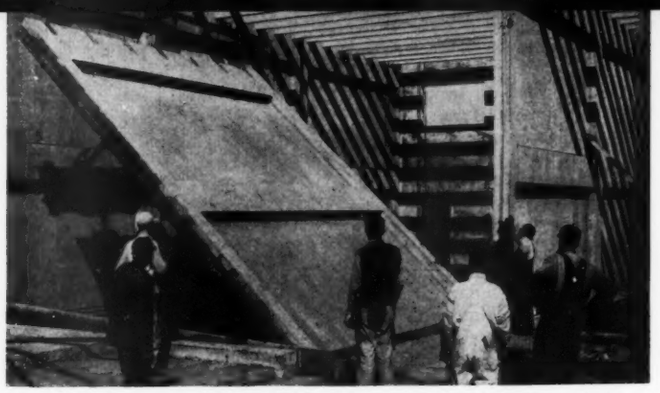
Tilt-Up Construction For Heavy Wall Panels

Vermiculite Concrete Used on Roof Decks Of St. Louis' Giant Produce Market



A wall and column section is being tilted into place on the Commission Row project.

• IN St. Louis, Mo., $3,000,000 Commission Row, just completed, is a construction landmark, not only because of its size, but also for the heavy design of its tilt-up walls. More than 3 miles of panels 10 to 12 inches thick were tilted, some weighing as much as 32 tons each. Of further interest is the method devised to place vermiculite-concrete roof insulation over permanent asbestos-board forms only ¼-inch thick. The roof area totals 326,000 square feet.

Design and Construction

Commission Row is one of the largest produce markets in the nation, and consists of two buildings, each 114 feet wide, 1,225 feet long, and 22 feet high, running north and south. Every 25 feet there is a division wall, making a total of 98 units. The buildings face each other across a central paved truckway 120 feet wide. On that side an enclosed concourse, 10 feet in width, extends the length of each structure, serving both as a truck dock and as a trading area for the commission men. Exterior walls of the concourse are equipped with overhead doors of varying sizes, none less than 10 feet high. On the opposite of each building is a railroad dock, 9 feet wide, canopied throughout its length and serviced by double trackage.

The concrete slab-on-ground floors are 5 inches thick, reinforced with 6 x 6 x 10 : 10 wire mesh. Supports are 18-inch cast-in-place piles, spaced 20 feet on centers east and west, and 25 feet on centers north and south. Much of the ground is filled land close to the Mississippi River, and it was necessary in some places to sink the piling 30 feet to reach bedrock.

The reinforced-concrete columns were poured integral with the precast wall sections. The design, weight, and double mat reinforcing of each panel varies, depending on the load carried. In alternate bays where there are balconies, the panels were designed to carry warehouse loads of 150 pounds per square foot in addition to the roof construction.

Supporting the balconies and roof deck are concrete joists precast of a modified I-beam section, using a truss-type steel assembly in which the joists act as independent beams. All joists have a clear span of 25 feet and are spaced 32 inches on centers. Within the building they are laid lengthwise; over the concourse, horizontally. Approximately 130,000 linear feet of precast joists were used.

Vermiculite-Concrete Roof Deck

The roof deck is a 3-inch slab of vermiculite insulating concrete, 1 to 4 mix (1 part portland cement to 4 parts vermiculite aggregate) placed over ¼-inch cement asbestos board, which served as the form and makes the finished ceiling below. The board rests on the ridge of the joists, and has a 1-inch bearing on each side.

The thin unanchored board was tricky to work on; nevertheless, an average day's pour ran between 9,000 and 10,000 square feet. Such speed was possible because screeds were put down over the entire roof area.

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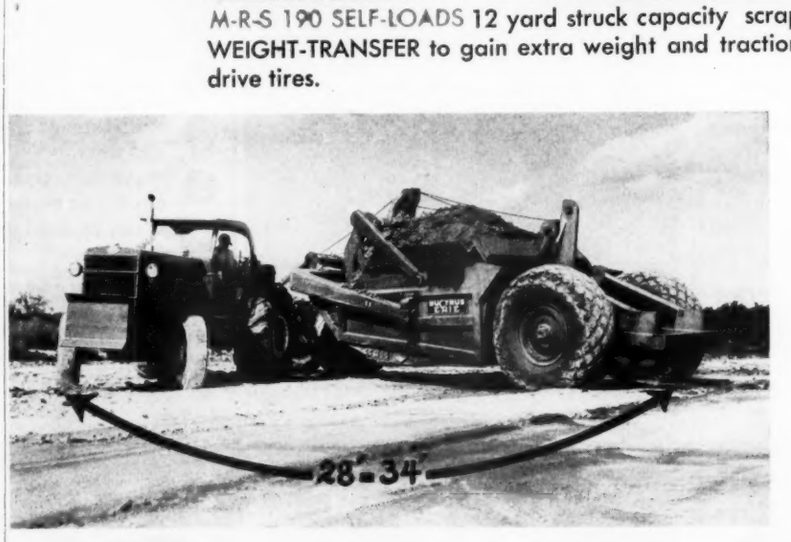
M-R-S 190 SELF-LOADS 12 yard struck capacity scraper using exclusive M-R-S WEIGHT-TRANSFER to gain extra weight and traction on the large 24:00 x 2 drive tires.



M-R-S 190 and 19 y struck capacity scrap makes a short 33 ft. dia eter non stop turn aft having been pusher loa ed. A short non-stop tu ing diameter of 28 ft. to ft. is practical for all M-R tractors with differe makes and models scrapers, and is especia advantageous on narr secondary roads.

THE EMBLEM OF DEPENDABILITY

M-R-S MANUFACTURING COMPANY

FLORA AND JACKSON, MISSISSIPPI, U S A

A Towermobile bucket raised the vermiculite-concrete mix to the roof where it was dumped into a 1-yard hopper.

and the concrete was poured in alternate panels about 12 feet wide, down the length of the buildings. The following day, the strips that had been omitted were filled in. This solved the breakage problem so far as the board was concerned, and made it easier for workmen to find a place to walk. Runways of ¾-inch plywood, spanning the joists, were used.

The asbestos board was first sprayed with a waterproofing compound. Conduit for electrical wires was placed next. Over this went 6 x 6 x 10 : 10 reinforcing mesh, then the vermiculite concrete, job-mixed in a mobile 2-yard mixer. A yard of concrete was turned out every three minutes.

A Towermobile bucket took the mix to the roof and dumped it into a 1-yard hopper with a bottom opening. From there it was unloaded into 5-cubic-foot buggies and wheeled to the pouring site. The light weight of vermiculite was a considerable advantage since twice as big a load, compared with sand concrete, could be buggied safely. An aluminum drag-off was used for screeding.

Average crew for the full roof operation was only 18 men, including those charging and operating the mixer and unloading material from the truck as it was needed. A large transport brought in 465 bags of aggregate at a time. None of the dry material was stockpiled, since it would have gotten too far away from the mixer which, with the Towermobile, was moved to a new location every four days.

One-inch copper joints were placed on the roof at 150-foot intervals over division walls to take care of expansion and contraction in the reinforced-concrete construction underneath. The decks were covered with a built-up roof of pitch and gravel. Drainage to downspouts in the center of the building was secured by sloping the joists. Flashing and fascia are copper.

Wall-Panel Erection

Speed characterized erection of the wall panels. They were tilted at the rate of 8 a day, although they are 19 to 25 feet wide, 22 feet high, and 10 to 12 inches thick. The typical exterior panel is 10 inches thick. In all, 700 were required. The panels were cast 2 tiers high because the floor slab, which served as the casting platform, was not large enough to accommodate both perimeter and division walls. Hunt Process solution, a paraffin-base separating medium, was used as the bond-breaking agent. It also served as a curing compound.

The panels could be handled after 14 days, a fact which was attributed to the unusual equipment. A 38-ton stiff-legged derrick, one of the largest ever used on such a job, picked up the panels at the top with a large balance beam, and eased them into place. The derrick supplied its own motive power, pulling itself along on wooden dollies. It let down its cable, which was then attached to a heavy tractor, and by winching it in the derrick worked itself.

Walls and Balconies

The wall sections were structurally tied together by welding steel plates cast in the panels to steel plates in the precast joists. Joints between panels and around footings were grouted. The steel door frames were cast in place, but weld plates were inserted for window frames, which were put in later. Precast concrete joists for the balcony floors were brought in through window openings and lowered into position. Fill-in blocks were provided so when a tenant needs more balcony space, the blocks can be knocked out and additional floor area be obtained. Lightweight concrete was used as the balcony floor fill.

Ninety-three of the units will be used by commission merchants. Ten will be brokers' offices, and there will be three restaurants.

The fire and vermin-proof buildings were designed by architect L. Roy Bowen & Associates. General contractors were Robinson Construction Co., whose experience in heavy bridge work was good background for this job. Precon Concrete Products Co. installed the roof decks. All firms are of St. Louis.

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This powerful rubber-tired tractor is GUARANTEED to self-load a 12 cubic yard struck capacity cable operated scraper with a minimum of 27,540 lbs. of clay loam soil of normal moisture in a distance of not more than 125 feet and a time of not more than 75 seconds! Loading in this short time and distance on hauls of 500 ft. and over assures production far in excess of that possible with a crawler scraper combination of the same struck capacity.

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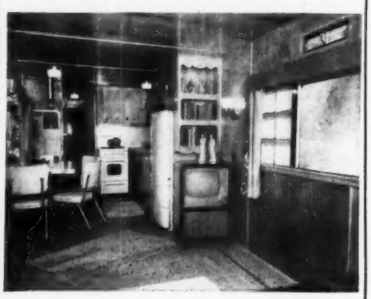

ABC COACH CO., 274 5TH ST., PINCONNING, MICH.

Hydraulic Puller Manual

A new service manual illustrating the use of hydraulic pullers in truck and tractor maintenance has been released by Owatonna Tool Co., 381 Cedar St., Owatonna, Minn.

The manual covers three hydraulic rams with capacities of 17½, 30, and 50 tons and illustrates the various pullers, attachments, and adaptors to be used in each range. Complete hydraulic-puller sets in each of the three capacities are listed together with shop and bench presses for use with each size of Power-Twin Center-Hole ram.

A number of new items, including a 30-ton hydraulic-cylinder sleeve puller, are included in the catalog.

Bulletin No. HY-1953 may be obtained from the company, or use the Request Card at page 18. Circle No. 439.

New Pipe Insulation Has Glass Fiber Base

A new 1-piece molded pipe insulation suited for temperatures up to 350 degrees has been announced by Gustin-Bacon Mfg. Co., 210 W. 10th St., Kansas City, Mo. G-B Ultrafine pipe insulation is made of fine-blown glass fibers bonded with a phenolic resin. It is available in 1-piece 6-foot lengths. The flexible and resilient pipe covering has one seam and snaps over the pipe.

Chief features stressed by the manufacturer are high thermal efficiency and lightness. The insulation will not break, crumble, or bend out of shape, and is said to be insoluble in water.

The new material can be painted or left as it is.

For further information write to the company, or use the Request Card at page 18. Circle No. 388.

Masonry Sealing Materials

A line of products for masonry walls that are used to moisture-seal walls, and provide good finished surfaces are shown in literature from Standard Dry Wall Products, Inc., Box No. X, New Eagle, Pa.

Waterplug is a quickset compound that stops the flow of water and is also used for grouting, filling, and anchoring.

Thoroseal is a base coating that fills and seals masonry surface. It is available in white and other colors.

Quickseal, a finishing material, is applied over the base coat to complete the sealing of the surface.

The company also offers a cementitious material, VaBar, that seals a masonry surface against penetration of rain water, and supplies a bond for cement or gypsum plaster. It is marketed ready for use with the addition of water.

Other products described are Thorite, a 20-minute-set patching mortar, and Thoroclear, an invisible water-repellent coating for above-grade masonry.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 468.

Data on Cork Insulation

A bulletin giving the composition, application, and uses of its cork insulation is available from Witco Chemical Co., 260 Madison Ave., New York 16, N. Y.

Witcote No. 820 is a cold-application fluid-type material composed of cork-insulating fillers and asbestos with a bituminous base. This is applied directly from the drum by hand-operated sprayguns. The booklet gives complete data as to proper thickness and coverage, as well as waterproofing and seam-sealing characteristics.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 426.

and travel at tractor speed. This means more jobs done, faster, with less equipment.

Only HYSTAWAY has *true* crawler tractor mobility and maneuverability because it mounts on a Caterpillar track-type tractor. Full track oscillation enables the Hystaway to travel over rough terrain without excessive damage to crawler equipment . . . eliminating the cost and necessity of having expensive standby hauling equipment on hand. Hystaway is the *only* revolving shovel with a complete track-type tractor for its undercarriage! This is the feature that makes the Hystaway the most modern excavator-crane available today.

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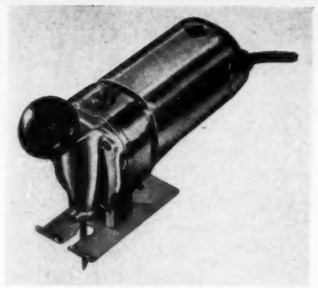

Electric Jig Saw

A portable electric jig saw said to do the work of a jig saw, sabre saw, keyhole saw, and most band saw operations has been announced by Black & Decker Mfg. Co., Towson 4, Md. The Utility jig saw, which can be guided with one hand, is supplied with five different types of blades for cutting both hard and soft wood, plywood, ferrous and non-ferrous metals, rubber, leather, plastics, composition boards, and insulating materials.

In addition to its portable use, the Utility saw can be mounted on an accessory table for bench work. Additional accessories including a joint attachment for making precision wood joints and a circle-cutting attachment to make circular pieces from 2 to 13 inches in diameter can be used with the table.

Among the features of this tool is its ability to make pocket cuts in wood without a drilled entrance hole. It cuts in places often inaccessible to circular or hand saws, according to the manufacturer. It makes straight, curved, or irregular cuts.

The capacity of the jig saw is rated at ½ inch in soft wood and ⅜ inch in hard wood. It is powered by a 115-volt ac or dc motor. Net weight of the unit is 3½ pounds.

For further information write to the company, or use the Request Card at page 18. Circle No. 394.

Field Lubrication Units

Grease, gear oil, and motor oil can be taken out to the equipment in the field with portable lubricators made by Chausse Mfg. Co., Inc., 4453 14th St., Detroit 8, Mich. New literature available covers 6 skid-mounted and portable semitrailer models.

The units have compressors that send air to pumps mounted on drums of lubricant. The lubricant is forced through reeled hoses to the point of lubrication through control valves.

All major components are described in the literature.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 383.

Davey Appoints Myers

The appointment is announced of R. G. Myers as southwestern district manager for Davey Compressor Co., Kent, Ohio.

Before joining Davey, Mr. Myers was affiliated with Twin Coach Co., Kent, Ohio, for over 20 years, becoming service director for the St. Louis, Mo., area. He will now be in charge of sales and service of Davey portable, industrial stationary, and truck-mounted compressors in Texas, Oklahoma, Louisiana, Arkansas, and New Mexico.

New Engine Announced

A 4-cylinder overhead-valve engine is announced by Ford Motor Co., Industrial Engine Department, Highland Park, Mich. The Model 134 develops 45 brake hp at 2,400 rpm. It has a 3.4375-inch bore and a 3.6-inch stroke.

The manufacturer points to the overhead-valves which are said to deliver more horsepower per cubic-inch displacement. Cylinders are cast en bloc of high-grade iron and centrifugal cast sleeves are used. Full-length water jackets completely surround each cylinder.

The oil system has a full-flow filter with renewable element.

For further information write to the company, or use the Request Card at page 18. Circle No. 438.

Cartridge-Type Stud Gun

A powder-powered tool that drives steel studs into concrete, steel, and masonry is shown in literature from Velocity Power Tool Co., 201 N. Braddock Ave., Pittsburgh 8, Pa. The tool uses an integral cartridge and stud unit. The expanding gases of the fired cartridge are used to imbed the stud in the work.

The literature shows a cutaway sketch of the driver that indicates the major features of the mechanism. Tables list sizes and types of stud units made by the company for use in the stud driver with large and small bore barrels.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 428.

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On your own job, under any conditions you choose, *time* the work cycle of a Cat* DW21 Tractor and No. 21 Scraper against any other make of similar equipment. Or, if you're using four-wheel tractors, make the same comparison with a DW20 or a DW10 unit. Check the yardage handled in an hour—or a day.

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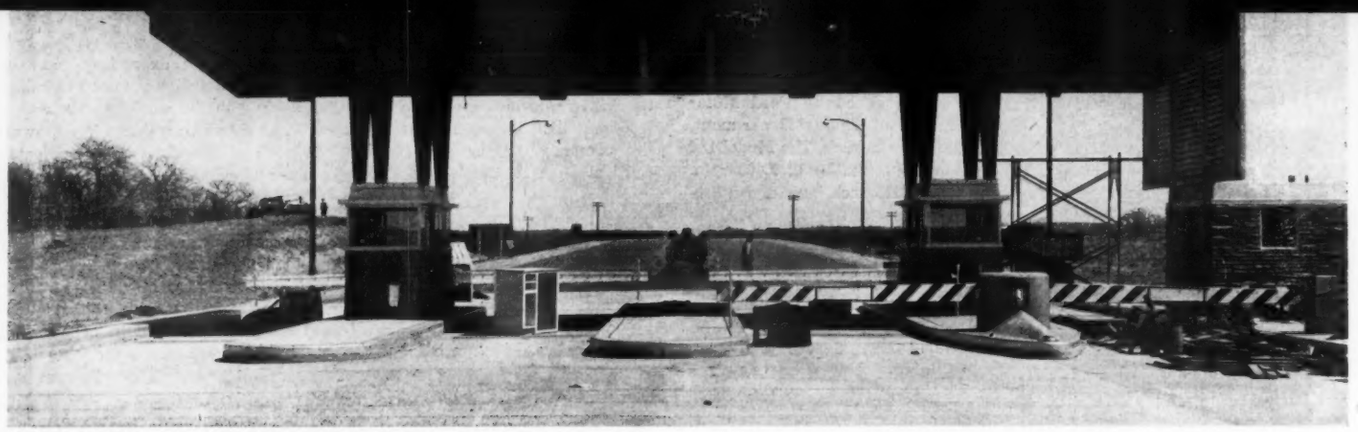

A view of the Oklahoma City entry toll gate just before it was completed.

Turner Turnpike—Oklahoma's Show Road

By RAY DAY

• THE average Oklahoman's conception of modern traffic has been revolutionized by the opening of the kind of highway no one dreamed would be necessary, 25 years ago, to handle traffic through the Sooner State.

Turner Turnpike is the name of the miracle road. Named for ex-Governor Roy Turner, the new toll road stretches 88 miles between Oklahoma City and Tulsa, Okla. Motorists who pay $1.40 toll can travel from one end to the other in about 1 hour and 45 minutes, and save a good hour's driving time compared to parallel route U. S. 66.

Even before the ribbon-cutting ceremony, Oklahoma's legislature was studying new proposals for toll facilities to end bad cases of traffic congestion. New facilities under study included an extension of the Turner Turnpike northeastward toward Joplin, Mo., and the Missouri line, a route from Oklahoma City north to the Kansas line, and a route south from Oklahoma City through Chickasha and Lawton, Okla., toward Wichita Falls Texas. A fourth route, from Tulsa toward Fort Smith, Arkansas, has hit enough local opposition to be shelved for the time being. Toll roads in the tri-state-area legislatures are hotter than a firecracker.

Turner Turnpike was conceived largely by one man: Roy Turner, ranchman, when he was governor. The traffic situation on U. S. 66 between Oklahoma City and Tulsa had deteriorated so badly from 1939 to 1945 that this piece of highway was rapidly getting a reputation as the worst road in America. Economic studies and Roy Turner's faith said that a toll facility would pay out. The fact that the project was privately financed justifies Turner's faith. His fight was carried forward by his successor, Governor Johnston Murray.

Delays were heartbreaking to everybody in the Oklahoma Turn-

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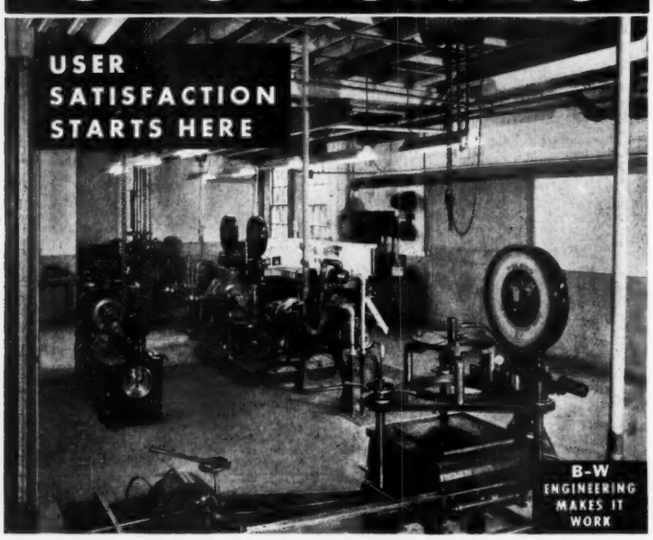

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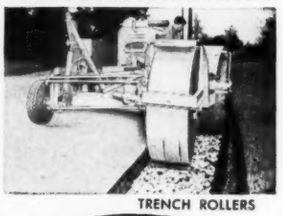

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pike Authority, the agency created by the Oklahoma Legislature to administer construction and design. The steel strike of 1952 curtailed construction for months. It took valuable time to iron out a disagreement between asphaltic and portland-cement concrete lines of thought just when the initial grading contracts were getting under way. How that difficulty was judged on its merits will be told a bit later.

Bonds for construction of the turnpike did not find a ready market at first. Balked in the original plans, the Authority went to the Reconstruction Finance Corp. Failing to get help there, Turner and his backers refused to admit defeat. Turner Turnpike, conceived in 1947, nearly died in 1950 until it received a last-minute reprieve. In 1950 a group of New York investment bankers became convinced of the soundness of the project and offered to purchase the bonds. Financing arrangements call for retirement of the total amount over a period of 40 years. The first bonds, maturing in 1958, bear 3.43 per cent interest.

The Asphalt-Concrete Difference

From the very start, H. E. Bailey, the general manager, let it be known publicly that no pavement design would be made in any sense arbitrarily, and he promised repeatedly that when pavement designs were made, alternate schemes incorporating both asphaltic and portland-cement concrete would be considered. The nationally known engineering firm of DeLeuw, Cather & Co., Chicago, Ill., was appointed to aid in the design.

In line with good practice, the first consideration after establishing the right-of-way was the urgency of getting some grading contracts under way. These grading contracts were written to call for subgrade construction and 16½ inches of select highly compacted soil subbase, the upper 4½ inches of which would be removed by paving contractors and used for shoulder and median construction. This would leave 12 inches of select soil subbase. The disagreement developed primarily over this material, rather than actual paving materials. However, resulting hearings brought the asphalt versus portland-cement concrete disagreement out for consideration, and the fight had to be resolved before grading could continue on any scale.

Engineering studies were made carefully and, surprisingly enough, showed that the Turnpike Authority actually saved $14,593 by putting in 12 inches of selective material on the 78.8-mile section then under dispute. The saving was made in a direct comparison between that method and an alternative one where only 6 inches of select material would be used and where ordinary unclassified excavation would be used for the remainder of the subgrade. That study finished the argument.

To handle the paving-materials controversy, Bailey again played so fairly that he refused to compare maintenance costs of new asphaltic-concrete pavement with concrete roads 20 years old.

Bailey did decide, however—and the Turnpike Authority backed his judgment—that possibly the most important unknown consideration was the comparative long-term maintenance cost between the two types of pavement. Since the Oklahoma Highway Department's experience was limited in this respect, Bailey sent out a letter to 17 state highway departments from coast to coast. The letter went out in July. By October he had his answers.

Kansas, a neighboring state to the north, was able to make a rather comprehensive answer, because Kansas had studies on all the design types then under consideration for Turner Turnpike. The design types were as follows:

a.) 8 inches of unreinforced portland-cement concrete paving on 4 inches of sand cushion.

b.) 9 inches of unreinforced portland-cement concrete paving on 3 inches of sand cushion.

c.) 5 inches of hot-mix asphaltic

(Continued on next page)

Design Directive Data—Turner Turnpike

Design axle load, 24,000 lbs. plus 20 per cent impact	*28,800 lbs.*
Maximum gradients	*3 per cent*
Minimum gradients	*0.3 per cent*
Design speed	*70 mph*
Minimum sight distance, vertical curves	*700 ft.*
Horizontal curves	*Not over 3 deg.*
Maximum curve on project	*1 deg. 30 min.*
Minimum right-of-way width	*200 ft.*
Minimum vertical clearances	*15 ft.*
Maximum curvature on interchange roads (radius)	*250 ft.*
Compaction in fills, per cent of standard Proctor	*90*
Compaction in select material, per cent of standard Proctor	*95*
Minimum lane width, Turnpike	*12 ft.*
Minimum lane width, interchange roads	*12 ft.*
Turnpike bridge design loading	*AASHO H20-S16*
Cross bridge design loading:	
U. S. 66	*H20-S16*
State roads	*H20*
Local roads	*H15*
Pavement transverse slope	*⅛ in. per ft.*

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Turner Turnpike—Oklahoma's Show Road

(Continued from preceding page)

concrete laid on 7 inches of high-type crushed-rock base.

d.) 6 inches of hot-mix asphaltic concrete laid on 6 inches of high-type rock base.

e.) 8 inches of hot-mix asphaltic concrete laid on 4 inches of high-type crushed-rock base.

In each of the above cases, the 12-inch blanket of select high-type soil material would be used. The effect of each of the designs would be to handle 24,000-pound axle loads plus 20 per cent impact, making an effective axle loading of 28,800 pounds.

Kansas replied from a maintenance study covering the years 1946, 1948, and 1949. In 1946 its maintenance for 52.1 miles of asphaltic concrete cost $109.88 a mile, while 1237.2 miles of portland-cement concrete pavement cost $613.64 per mile. In 1948 the maintenance on 200.4 miles of asphaltic concrete cost $445.85 per mile as compared to $561.44 per mile on 1,203 miles of portland-cement concrete. In 1949 the comparison was $422.08 against $635.76 per mile between asphaltic and portland cement, respectively. A weighted average over the 3-year period showed that asphaltic-concrete highways in Kansas cost $397.58 for annual maintenance, while portland-cement pavement cost $607.11 per mile.

Texas, too, reported that in every maintenance comparison asphaltic-concrete pavement laid on a good base was cheaper to maintain than portland-cement concrete. Missouri had no data to make a comparison. Maine reported annual maintenance costs of $145.38 against $219.45 in favor of asphaltic concrete. Oregon's figures were $408.00 to $586.00 per mile, in favor of asphaltic concrete. California summed up her picture with $158.00 to $261.00, in favor of asphalt. New Hampshire, the homestead of Yankee thrift, said, for the year 1949: "$61.72 to $133.68. Asphalt."

And so it went, state after state. The Authority made its study carefully. Even then, when maintenance figures favored asphalt over portland cement for the same design criteria, every paving contract was let calling for alternate bids for a portland-cement design. Every one of the low bids was for asphaltic concrete. When all the figures were in, here is the way it added up:

1. The total of low portland-cement concrete bids received was $10,452,484.10.

2. The total of low asphaltic-concrete bids received was $9,291,364.43.

3. The saving in initial investment by using asphaltic concrete was $1,161,119.67 on a $38,000,000 job.

4. Considered without interest, this saving would be available for maintenance in the next 40 years, and maintenance costs promised to be less on the basis of experience of other states.

5. Available for maintenance for each of the 40 years is $29,027.99 of this saving.

6. Invested at 3½ per cent, the interest from this saving would provide $492.12 per mile for maintenance each year for 40 years.

7. The original investment would add $351.52 per mile.

8. The asphaltic-concrete choice, considering initial saving and interest, would make available $843.64 a year for 40 years for each mile of Turner Turnpike.

Left to right: W. D. Hoback, chief engineer, and H. E. Bailey, general manager of the Oklahoma Turnpike Authority. Cut section of the Turnpike paving design is shown by the model in the center.

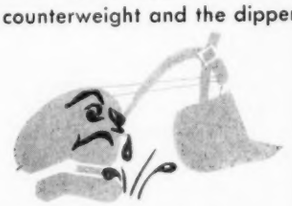
Limited strictly by Oklahoma law as to cost, location, and other such factors, Bailey himself is the first to say that the design is not the final answer to tomorrow's traffic problems. In a report to the Turnpike Authority, he said simply that it was a sound, and possibly the best, answer to a problem with governing limitations. He urged that the 28,800-pound axle loading be considered a minimum, rather than an average or maximum, criterion. His report even ventured a wager that axle loadings of 36,000 pounds and more lie in the future, that the day will come when the Turnpike will have to be strengthened by upper

There are TWO WAYS *to*

1 THE EASY WAY . . . .

. . . is to design a few basic machines, and then build up a line of additional models by adding extra counterweight and by speeding up the engine to try to meet two or three size requirements. The only real difference in these models lies in the counterweight and the dipper capacity.

Of course, some of these machines will carry dippers too small. They won't produce the output they should — power is wasted.



Other machines with dippers too large and counterweight too heavy will sweat and strain from overloads and overwork. They will run up high repair bills and wear out in a hurry. Strength is not built in where you need it.

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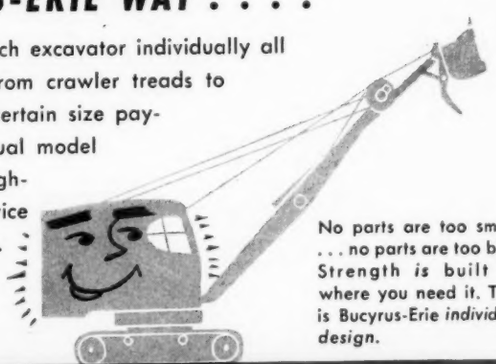
. . . is to design each excavator individually all the way through from crawler treads to boom point for a certain size payload. Each individual model is engineered throughout to meet the service and loads required.



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decking, that the Authority may even be criticized for not building the road even stronger now, and that the same things would be true if portland-cement concrete could have been selected as economically.

Design

The Turnpike proper is 88 miles long. In addition to the Turnpike proper, the cities of Oklahoma City and Tulsa have built 4-lane divided by-passes through northern Oklahoma City and southern Tulsa to move transcontinental traffic through their metropolitan areas. Work is now continuing to take these by-passes from east of Tulsa to west of Oklahoma City, providing a total with the Turnpike of 102 miles of continuous 4-lane-divided limited-access paving.

There are no grades on the Turnpike of more than 3 per cent, as compared with 6 per cent grades on parallel U. S. 66. There are no curves west of Sapulpa, Okla., greater than 30 minutes. And a 30-minute curve is so gentle that driving is no different from a straight-away tangent stretch. There is a 1-degree 30-minute curve at the east edge of Sapulpa, and a 1-degree curve near the Tulsa terminus. Both curves are expected to be safe at 70 miles an hour.

The asphaltic-concrete paving will consist of two 24-foot lanes, one in each direction, separated by a 15-foot grassed median and a 12-foot paved shoulder. This shoulder will consist of a 6-inch asphalt-stabilized base and a bituminous-surface course on each side of the through paving, making 36 feet of paving on each side of the median, or 72 feet of paving from shoulder to shoulder.

The shoulder paving is underlaid by 12 inches or more of select subgrade material, well drained, and is therefore a much higher type than on most Oklahoma state highways. The paved shoulders are not intended as driving lanes, but serve the purpose rather to take disabled vehicles clear of the traffic flow in all kinds of weather.

Guardrail has been placed 10 feet from the edge of the pavement on all fills over 10 feet high. Reflectorized delineators have been placed in the median and on both shoulders at intervals of from 100 to 200 feet throughout the length of the Turnpike. A dashed reflectorized center stripe separates the two driving lanes. Traffic signs are large reflectorized white Scotchlite letters on a reflectorized green background.

The Turnpike has modern restaurant and service station facilities. An International Business Machine card system keeps toll collections straight, both for the motorist as well as the Turnpike Authority. Phillips Petroleum Co. operates all filling stations, while Howard Johnson Co. operates the five restaurants along the route.

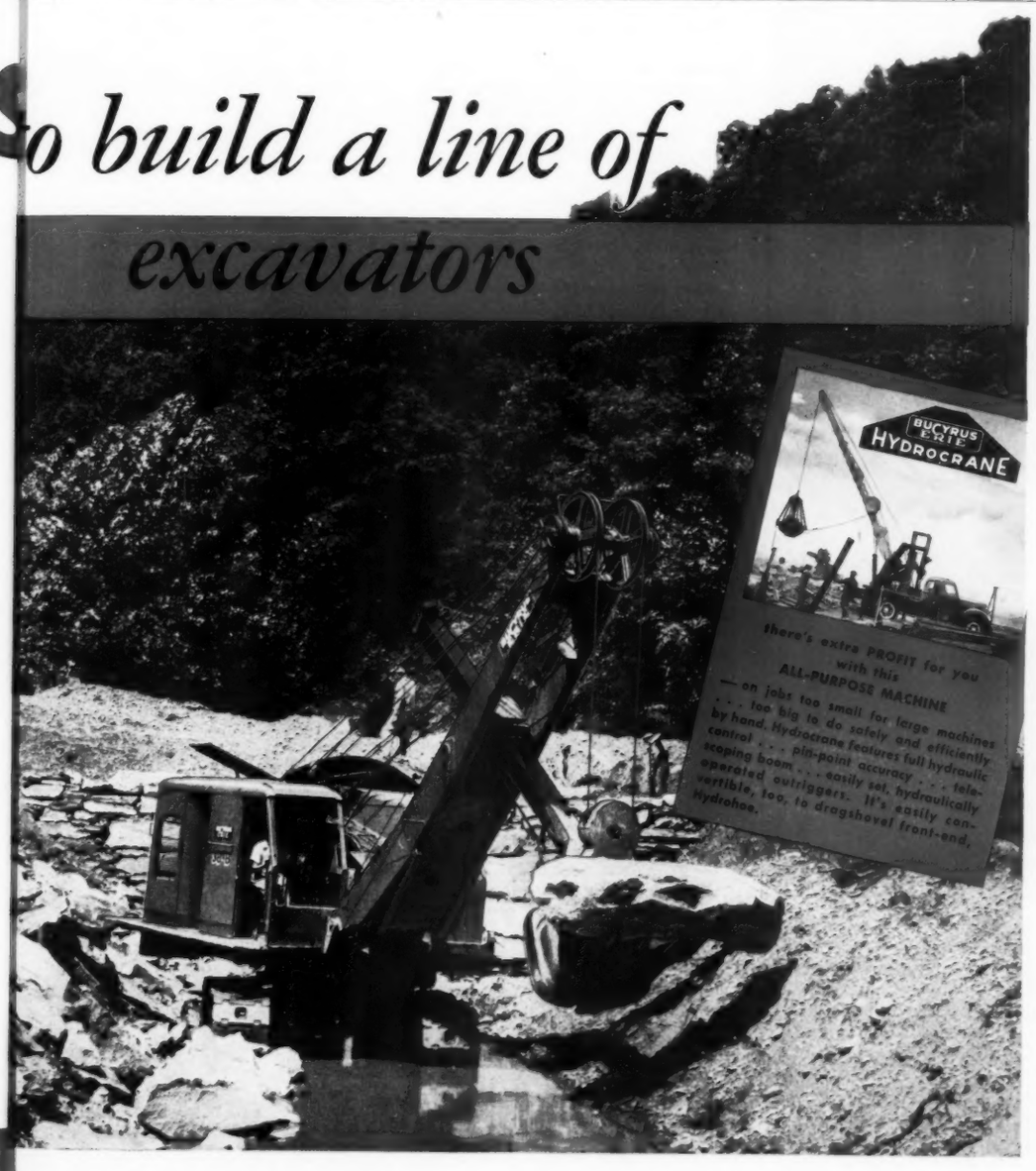
Of interest in predicting a possible future trend in traffic regulation is a recent piece of legislation regulating speeds. The Authority has already approved a minimum speed: 40 mph. At the present time Oklahoma's maximum speed is 65 mph, but that may be changed so far as the Turnpike is concerned. It is designed for high speed, although motorists should make the best progress in relation to gas consumption if they drive the route at a steady 55 or 60 mph.

Personnel

The Oklahoma Turnpike Authority is headed by Governor Johnston Murray and by Chairman J. Wiley Richardson. R. P. Matthews is vice chairman, Glen R. Key is secretary-treasurer, and Joe Jarboe is a member. H. E. Bailey, formerly Oklahoma's state director of highways, is general manager; W. D. Hoback is chief engineer; and Leon Shipp is general counsel.

The Turnpike also owes part of its existence to the resourcefulness and ingenuity of the 91 contractors who participated in its construction, and to local engineering firms who worked closely with DeLeuw, Cather & Co., consulting engineers.

Note: An article describing a typical paving contract on the Turner Turnpike starts on the following page.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Brush Cutter and Saw

A brush-cutting power scythe cuts weeds, grass, or reeds, and converts to a chain saw to handle trees, or any growth up to 8 inches in diameter. Literature available from Hoffco, Inc., 411 N. 8th St., Richmond, Ind., manufacturer, gives details on the Scythette and Sawette, as the combination unit is called for brush cutting and sawing respectively.

The machine has a 2-hp engine with an air vane-type governor which adjusts engine speed to fit load requirements. The air-cooling system uses a large centrifugal blower on a flywheel-type Wico magneto to produce a stream of cooling air.

A remote thumb-button control adjusts the operating speed. Gas-tank capacity is 1 quart.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 416.

Kettering Receives Award

At the annual meeting of the National Society of Professional Engineers held in Daytona Beach, Fla., June 18 to 20, Charles F. Kettering, vice president of General Motors and nationally known engineer, received the NSPE Award, granted on the basis of meritorious service to the engineering profession. The two previous recipients of the award have been bridge-builder D. B. Steinman and former President Herbert Hoover.

At the meeting, the Society installed its new president, T. Carr Forrest, Jr., of Dallas, Texas.

Amis Construction Co.'s Pioneer Continuflo asphalt plant at work. At the right, hot-mix asphaltic concrete is discharged into a waiting batch truck. *Ray Day Photo*

Hot-Mix Crew Speeds Tur

• STRAIGHT through the winter months, despite rains and near-freezing temperatures, paving contractors on Oklahoma's Turner Turnpike worked to hurry the 88-mile show road to May 16 completion. Typical of the several paving contractors was Amis Construction Co., Oklahoma City, Okla., which had about 8 miles of paving centered around Bristow, Okla. The astonishing thing about the Amis winter operation was that a paving production averaging 185 tons per hour was maintained, in spite of low temperatures and aggregate moisture content never lower than 5 per cent and often as high as 7.

The Amis contract, comprising two jobs—one at $683,659 and the other at $119,179—included preparation and placement of 7 inches of compacted base rock, blended with a soil binder; 3 inches of coarse asphaltic-concrete base; 2 inches of fine asphaltic-concrete surfacing; shoulder stabilization; median construction; and appurtenant work.

The "hurry-up" winter schedule became necessary after last summer's steel strike which delayed the

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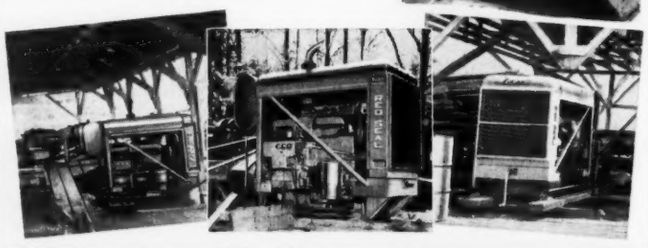

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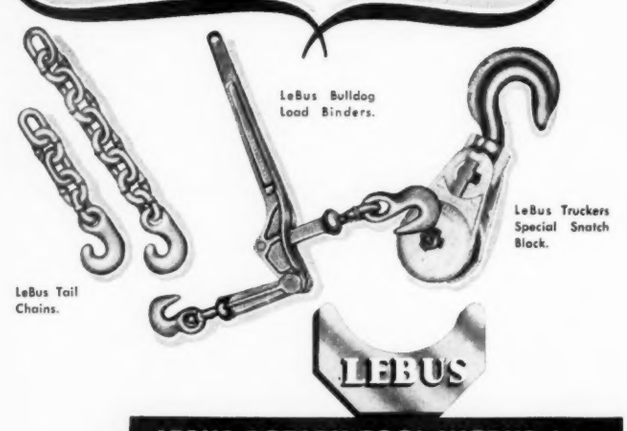

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ed: Turner Turnpike Paving

High Production Mark Set in Winter With Aggregates Wet From Frost and Rains on Oklahoma's Show Road

over-all progress of the Turner Turnpike. Bridge contractors waiting for steel, for example, had to have access to their work when it finally came, so gaps had to be left in the paving in places. Although the Amis job was affected, when the final showdown came and the pressure was on, the reserve experience of the crew under project superintendent John R. Waugh, combined with the dependability of equipment the firm had placed on the project, gave the necessary "edge" favoring completion in spite of all the obstacles.

Two lanes of pavement were involved. The base course of asphaltic concrete was 24½, the top course 24 feet wide. Details of the pavement design for the turnpike are given in the companion article to this piece (beginning on page 24). The constant problem from the standpoint of Amis' crews was not how much paving there was. It was, rather, "Will the rains hold off for just one more day so we can lay down 5,600 feet and beat our high production mark to date?"

Base Work Done First

The first order of business, prior

(Continued on next page)

Steel-wheel rolling was the last step in hot-mix work. A Galion roller is shown here. *Ray Day Photo*

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Hot-Mix Crew Speeds Turner Turnpike Paving

(Continued from preceding page)

to paving, was the construction of the rock base. Under previous grading contracts let by DeLeuw, Cather & Co., consulting engineers for the Oklahoma Turnpike Authority, the subgrade had been shaped and built to 90 per cent of standard Proctor density. In addition, a select granular soil cushion 16½ inches thick had been placed over the subgrade, and heavily compacted to 95 per cent.

Amis arranged a subcontract with H. D. Youngman Construction Co. to handle the 7-inch rock base. Youngman first bladed off the upper 4½ inches of select soil for use under the turnpike shoulder and the dividing median. Following this blading operation, the crushed rock was brought in, blended with select soil, blade-mixed and watered, and laid down in two 3½-inch compacted lifts. The gradation requirements for this rock-base material were:

Size screen	Per cent passing
2-in.	100
1½-in.	70–100
1-in.	55–85
¾-in.	50–80
⅜-in.	40–70
No. 4	30–60
No. 10	20–50
No. 40	10–30
No. 200	5–15

Two Barber-Greene finishers take hot-mix from the batch trucks and place it on the highway. Surface course material is being laid here. *Ray Day Photo*

Following the placement of this special base and its final tight-blading and rolling, the surface was sealed with an application of MC-1 asphalt, applied at the rate of 0.35 gallon per square yard. This prime coat not only sealed the base from rain penetration, but also furnished an excellent bond between the rock base and the asphalt topping to follow later.

Amis Makes Own Aggregates

The Amis organization made its own mineral aggregates for the 70,000-ton hot-mix job. In fact, the rock-production plant which was set up 17 miles away at one time was turning out mineral aggregates, shoulder chips, and base rock all at the same time.

The rock-production plant embodied five reduction units. Arranged in line were a Pioneer Model 153 plant with a 30 x 42-inch jaw crusher; a Cedarapids 18 x 36-inch jaw; a Pioneer 54 x 24-inch triple-roll crusher; and a Pioneer 46-VE Duplex rock plant, embodying both 10 x 36-inch jaw and 40 x 22-inch roll units. The heavy production loads were thrown to the Pioneer 46-VE Duplex, such as armor-chip production. The setup was so efficient that 200 tons an hour were taken out of the plant when crushing was going down as fine as ⅝ inch. The rock in general was limestone, produced from a pit near Drumright, Okla.

Specifications for the mineral aggregate were strict but fair. They were as follows:

Size screen	Type A base mix per cent passing	Type B surface per cent passing
1½-in.	100	.....
1-in.	90–100	.....
¾-in.	.....	100
½-in.	65–80	90–100
No. 4	45–55	55–80
No. 10	30–45	40–55
No. 40	20–30	20–37
No. 80	10–20	10–25
No. 200	3–7	4–8
Asphalt (85–100 pen.)	4.5 to 6.5 per cent	5 to 7 per cent

The mineral aggregates, produced by the rock plant to meet the above specifications, were blended and trucked to the hot-plant location near Bristow. There they were

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dumped in separate piles for Type A and B mixing. In addition, a supply of fine soil was also added when necessary by stockpiling a supply of this material near the hot plant.

In fact, the production from stock of a strong dense-finished asphaltic concrete from a 3-bin plant separation was a source of satisfaction not only to the contractor's crew, but to the engineers as well. Actually, Waugh thought at first that an auxiliary conveyor might be necessary to feed fine 200-mesh material into the mix which, as he put it, "is all you usually use a fourth bin for, anyway." The auxiliary device was never necessary, and it stood idle for months while the plant turned out specification material on a straight 3-bin separation.

Continuous-Mix Hot Plant

To handle the 70,000-ton asphaltic concrete-mixing assignment, Amis gave the job to its Pioneer Model 101 Continuflo asphalt plant, which it purchased in 1950 and has used since to turn out about 230,000 tons of material. The plant has done highway work for the Oklahoma Highway Department, for the airfield pavement at Wichita Falls, Texas, for the U. S. Air Force, and some work for the Corps of Engineers, U. S. Army.

The Pioneer plant was able to handle the Bristow job from one setup near the outskirts of the city, adjacent to the Turnpike. Amis nevertheless had the plant fully mobile—actually it was fully mobile as a stock model without alteration—and it could shut down, cool off, dismantle, move, and set up again in from ten days to two weeks.

Some of the work the plant has done is astonishing. Amis uses electric power for all drive motors throughout, and fires the plant with natural gas. This makes for a clean efficient setup. In February, for example—certainly not a favorable asphalt month normally—the plant put out 29,000 tons at a production rate of 185 tons an hour for the hours it worked. Moisture content of the material dried averaged 6 per cent, and both base and surface course material were handled during the month. Natural gas firing, coupled with the inherent efficiency of the big 90-inch-diameter 24-foot trunnion-driven dryer, produced an end-of-month cost figure of only 4 cents per ton for heating and drying the aggregate.

Maintenance on the plant was negligible, according to Waugh and to Fred Tarver, plant foreman.

"We ran 230,000 tons without replacing a single dryer bearing," said Tarver. "Bearing life even on the pugmill where there's a pretty fair thrust was satisfactory."

Waugh said, "In those 230,000 tons we had to replace only about 12 fire bricks. And that wouldn't have been necessary if they hadn't been broken, rather than burned."

The plant was set up so that the prevailing winds blew out across the asphalt storage tanks, keeping the plant clean. There was little smoke and dust. Fines escaping through the stack were reclaimed by the plant's dust-collection system, and carried by screw feed over to the hot

(Concluded on next page)

Project superintendent J. R. Waugh (left) and hot-plant foreman Fred Tarver of the Amis Construction Co., Oklahoma City, Okla., which had an 8-mile paving contract on the Turner Turnpike.

Ray Day Photo

This BROWNING 17½-Ton Rubber Mounted Truck Crane, equipped with a half-yard, cable-crowd shovel attachment, moves at highway speed from job to job on excavating operations for a mid-western contractor. Maneuverability of the Browning helps speed up jobs in hard-to-get-in places.

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Turner Turnpike Paving

(Continued from preceding page)

elevator where they re-entered the mix.

Mineral aggregates were stockpiled closely enough to the plant so that a Marion 43-M clam charged the feeder bin directly. The aggregates passed by conveyor to the dryer, where the moisture was removed entirely and the rock was heated to 300 degrees. Leaving the dryer, the aggregates then passed by hot elevator to the plant screens, where they were sized to three bins. The feed of both the aggregates and asphalt on the Pioneer 101 Continuflo plant was so closely coordinated that accuracy of mix no longer was a problem to engineers concerned with stability and strength of the finished product.

The 85-100 penetration asphaltic cement originated in the Stroud refinery of Allied Materials Corp., and was trucked at flow temperature to the Bristow plant site. A Cleaver-Brooks heater and pump at that point helped to boost the tough-handling low-penetration material to a pair of 10,000-gallon horizontal storage tanks. Steam coils in these tanks, heated by the Cleaver-Brooks steam generator, kept the asphalt hot. The Pioneer plant had its built-in pumping system to move the asphalt toward the pugmill.

As regularly as clockwork, the hot plant kept a flow of about 185 tons per hour moving into the fleet of batch trucks which paraded beneath the pugmill discharge point. On the maximum haul, 14 batch trucks were used. Some were company-owned; some were rented. The average load per trip was about 8 tons, and because of weather and hauling conditions, a canvas cover was used over the loaded material.

Two Laydown Machines Used

Paving was beautifully timed. With such good production output from the plant, Amis used two Barber-Greene laydown machines to handle the material. Working very closely together, the machines each handled half the total traffic lane. The base-course material for the total length of the job on one side of the median strip was run first, followed by the surfacing for that side. The next half was then repeated in the same manner.

Because of an excellent mix design and consistent accuracy in its production, the fresh asphalt was found to be unusually stable right from the start, and rollers worked up very closely to the laydown machines with the breakdown roll. The first roller pass was made by an 8-ton Buffalo-Springfield, followed by a 5-ton Huber and a 10-ton Galion. Shortly after the final compaction had been delivered, the new pavement was used without hesitation for the delivery of other paving farther down the road.

The Amis contract was an excellent example of the best in modern asphaltic-concrete paving. In spite of seasonal temperature and moisture conditions adverse by any standards, Amis and the other paving contractors made them seem unimportant.

Personnel

Amis Construction Co. is headed by W. D. and R. T. Amis, partners, with Glen Voegelin as chief engineer. In addition to Waugh and Tarver, field personnel included Bill Nutall, laydown foreman, and Curtis Smith, shoulder superintendent.

All work under the Amis contract was under the general supervision of H. E. Bailey, general manager of the Oklahoma Turnpike Authority, and W. D. Hoback, chief engineer.

Welding Instruction

A new folder tells how to apply any of 11 alloys, including silver solder, and their companion fluxes. The booklet also describes a galvanizing powder for gas welding, brazing, soldering, and tinning commercial metals.

The Doc Alloys Kit made by All-State Welding Alloys Co., Inc., 273 Ferris Ave., White Plains, N. Y., is featured. The kit consists of the materials needed for routine maintenance.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 417.

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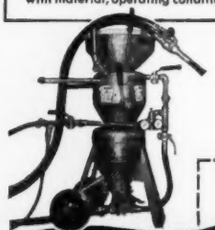

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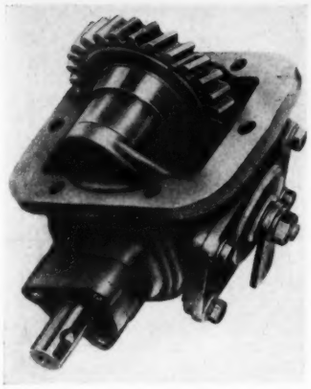

Truck Power Takeoff

A power takeoff for the new 5-speed heavy-duty 1953 Ford trucks is announced by Chelsea Products, Inc., Chelsea, Mich. The new model has eliminated the adapter of previous units, making for simpler right-hand side mounting. The unit weighs 20½ pounds. Either wire or lever-control shifting can be had with this new model.

The 15 HF is available in light and heavy-duty models.

For further information write to the company, or use the Request Card at page 18. Circle No. 462.

Roof Maintenance Data

A booklet on roof maintenance is available from The Tremco Mfg. Co., 8701 Kinsman Road, Cleveland, Ohio. "Solving Roof Problems" is illustrated by photographs, drawings, and diagrams, and discusses such subjects as the various types of roofs, how they are built, what factors enter into their deterioration, and how roof troubles can be diagnosed and treated.

Other topics taken up are laying the built-up roof, diagnosing roof conditions, and the repair of copings and parapets.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 429.

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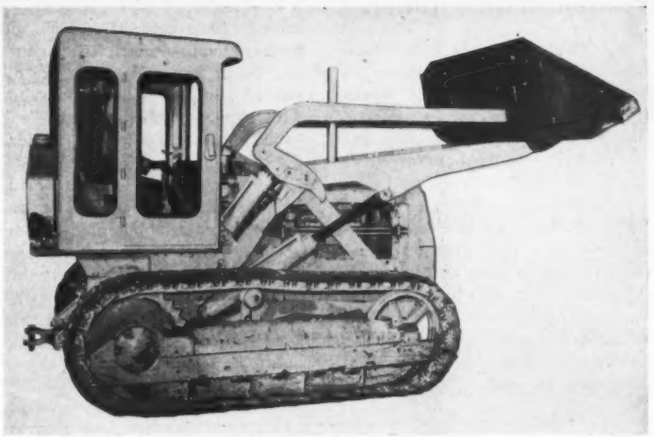
Cab for Tractor-Loader

A cab for the Caterpillar HT4 Traxcavator is produced by Crenlo, Inc., Department KP, Rochester, Minn. The all-steel Crenlo cab is arc-welded and reinforced by framing of 3/16-inch-thick structural members. Windows are 3/16-inch safety glass mounted in self-sealing weatherstrip.

A canvas curtain, which is removable in warm weather, extends from the bottom of the windshield to the dash and floor plate. Doors may be fastened in open position.

The cab is said to have good visibility and a view of the dozer blade in all positions. Base of the cab bolts directly to the tractor fender.

Dimensions are 56 inches in height, 44¾ inches in length, with a 52½-inch width across the cab.



The Crenlo cab on the Caterpillar HT4 Traxcavator.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 405.

Every contractor should have these three money savers!

CLECO RC-50 and RC-80 AIR-OPERATED PAVING BREAKERS

The Reed-Cleco Valve, found only in Cleco Paving Breakers, gives full control of both power and return strokes.

Cleco Paving Breakers hit harder and faster and have less recoil. They produce more work per man hour and cost less to maintain than any other demolition tools in their classes.

CLECO 183-A AIR-OPERATED SUMP PUMP

340 gpm against a 10′ head.
124 gpm against a 70′ head.

High capacity, light weight, low air consumption make the Cleco 183-A Sump Pump the first choice wherever a high-capacity portable pump is needed.

CLECO No. 5A AIR-OPERATED BACKFILL TAMPER

- Full power stroke of the piston gives deeper penetration and faster compaction.
- Rugged, heavy-duty construction for long life and low maintenance.
- Light weight and excellent balance for easy handling.

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CLECO DIVISION
of the REED ROLLER BIT COMPANY, 5125 Clinton Drive, Houston 20, Texas, U.S.A.

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In Canada: Cleco Pneumatic Tool Company of Canada, Ltd., 927 Millwood Road, Toronto (Leaside), Ontario
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Concrete-Hoisting Towers

A booklet on a light-duty panel-type concrete-hoisting tower is available from Archer Iron Works, Inc., 2438 W. 34th Place, Chicago 8, Ill. It comes in both single and double-well models, both of which can be equipped with ½-yard concrete apparatus and Chicago boom.

A broken-cable safety device may be attached to the platform or concrete bucket to prevent them from falling in case a cable breaks. When this safety device is used with a downspeed-control governor, men can be carried on these towers, according to the manufacturer.

The tower is made of pipe and tubing. Base, cathead, and elevator frames are of suitable size structural members. The end panels are all-welded sections of pipe and tubing with slip-fit joints assembled with loose girts and diagonals to form the tower frame.

The tower is a self-supporting structure up to 52 feet high, and tied to a building it may be used to hoist up to 200 feet. It is capable of handling three wheelbarrows or two concrete buggies.

This literature may be obtained from the company, or use the Request Card that is bound in at page 18. Circle No. 408.

Diesel and Generator Unit

Literature is available on a diesel power unit that delivers mechanical and electric power simultaneously. The Murphy Mech-Elec unit has a 50-kw generator. All power up to the rated capacity of the engine that is not used in generating electricity is available at the power-takeoff shaft. Since the generator is connected ahead of the clutch, electricity for lights or conveyors can be taken off even after the mechanical takeoff is disengaged.

The diesel engine is a 6-cylinder 4-cycle unit. Models available range from 135 to 210 hp. This is the total of both mechanical and electric power.

To obtain this literature write to Murphy Diesel Co., 5317 W. Burnham St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 341.

International Move

The motor-truck sales and service branch of International Harvester Co., Chicago, Ill., manufacturer of highway equipment, has been moved from the corner of S. Clinton and Duck Streets, Fort Wayne, Ind., to a new building at 207 E. Superior St. George R. Gear continues as manager.

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CHECK THESE OUTSTANDING FEATURES:

- Lever actuated independent control of bowl lift, apron and ejector
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- 10 speed transmission
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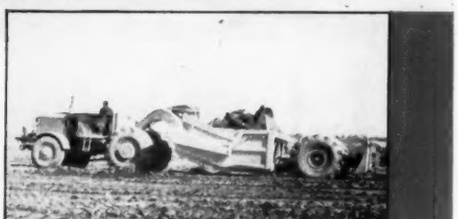
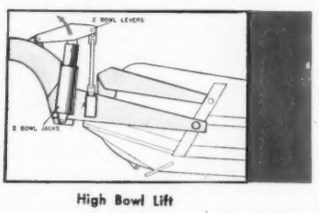


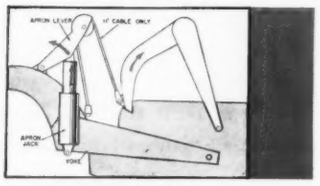
THIS improved lever-type 15.5 yd. Euclid Scraper sets a completely new standard for scraper design, performance and serviceability. It has many profit making features that are not available in any other scraper on the market.

For example, the 10 speed transmission means faster average speeds and more pay trips per hour. Lever action using interchangeable hydraulic jacks eliminates all but 12 feet of cable. A new simplified control system consists of internally mounted pump, valve and tank in one compact assembly—there are no suction hoses and complicated connections. The planetary drive axle—the same model used in thousands of Rear-Dump Euclids—is easy to service and has proved its efficient long life performance on hundreds of tough jobs.

Yes, "Euc" Scrapers are better than ever—in performance, production, maintenance cost and job availability. See your Euclid distributor for all the facts that add up to less down time, lower costs and more profit.



High Bowl Lift



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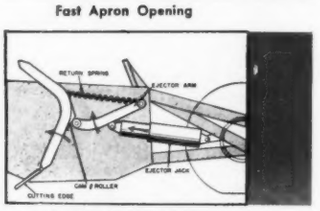

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New Air Regulator

An air regulator said to handle a large volume of compressed air with a minimum of pressure drop is being marketed by DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.

The HAA regulator has a capacity of 80 cfm at 100 pounds line pressure. It is manufactured in two models, each basically the same, with the exception of inlet and outlet connection arrangements.

The device uses air pressure against the regulating diaphragm instead of the conventional spring-loaded diaphragm. It provides power regulation. This feature is said to make adjustment of the control knob easier when regulating air pressure. Air flow increases as demand increases without affecting the pressure which has been set.

The maximum pressure which can be regulated is 135 psi and maximum line pressure has been set at 300 psi. The manufacturer recommends that a strainer or filter be installed in the air-supply line.

The unit is about 3 inches wide and 4½ inches high.

For further information write to the company, or use the Request Card at page 18. Circle No. 343.

Equipment-Cleaning Units

Equipment cleaners that work at pressures up to 400 pounds at any temperature from cold tap water to straight steam are shown in literature available from Malsbary Mfg. Co., 845 92nd Ave., Oakland 3, Calif. These cleaners use a pumping system that replaces steam as a source of working pressure. The range of temperature and pressure offered allows the operator to use the most efficient spray for the particular job at hand.

The company also makes steam vapor-type cleaners for lighter operations. A portion of the folder is devoted to explaining the advantages of consistent cleaning of equipment with company's cleaners. Among these are saving the mechanic's time, increasing life of the equipment by removing corrosive materials, revealing repair needs, reducing fire hazards, and helping in the company's public relations.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 430.

Two resourceful Memphis, Tenn., contractors—A & P Construction Co. and A. Erwin Co.—use a Drott Bull Clam shovel, mounted on an International TD-9 tractor, to transport pea gravel from stockpile to trenches 4 feet deep x 3 feet wide. The clam lip is controlled to regulate the flow of material.

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Quality built and design-engineered to guarantee a lifetime of living pleasure, HOWARD all-steel insulated Mansion Coach homes deliver the most in value —always! Enthusiastic owners from Alaska to Florida voluntarily testify to the low upkeep and high trade-in value of these time-tested HOWARD Mansion Coach homes. There's a model designed to meet every family requirement at your nearest HOWARD Dealers, see it now! For further information, write: Department 20 BOX 2163

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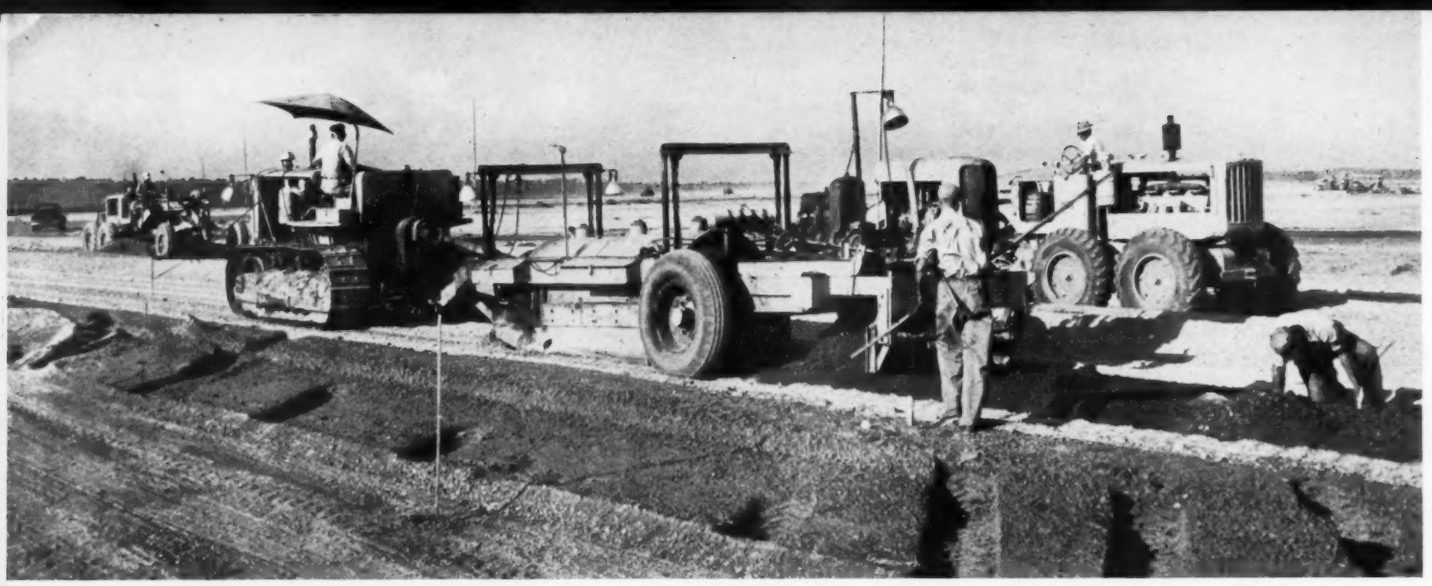

A Wood Roadmixer, pulled by a Caterpillar D8 tractor, mixes 70 per cent shell and 30 per cent sand for the runway base course at Forrest Sherman Field.

An 8,000-Foot Runway Is Built for Jets

Flexible Pavement Is Laid on Sand-Shell Base Course; Reinforced Concrete for 500 Feet at the Ends

By WILLIAM H. QUIRK, Editor

• EARLY this year the first phase of the construction of Forrest Sherman Field was completed. Forrest Sherman Field, a new Navy airfield for pilot training located at the U. S. Naval Air Station, Pensacola, Fla., occupies a 5-square-mile area west of the main station and north of historic Fort Barrancas. The initial phase of construction includes an 8,000-foot east-west runway, 200 feet wide, with a 75-foot-wide taxi-

A New Slant

on Sand Classifying!

Eagle Plant at American Sand Co., Turner, Kansas, makes variety of desired sand blends!

"Seasoned to taste" is the way American Sand Co. turns out sand. Their Eagle Washing, Classifying and Dehydrating Plant scalps off excess water, classifies the sand into various meshes, then blends the sand back together to produce the specification material desired. Hydraulic classification takes place in the Eagle Water Scalping Tank — coarser mesh settling at the feed-in end — finer mesh at the water overflow end and the intermediate meshes in-between. Through adjustable bleeder valves the separated sand flows to a divided collecting-blending flume. Splitters can be adjusted to feed any blend, to either of the Eagle Screw Units for final washing, classifying and dehydrating.

Eagle Equipment—"the last word" in washing and classifying—based upon nearly half a century of experience—can modernize your plant—quickly returning its cost—whether pumping operation like American Sand or dry pit. Let a qualified Eagle distributor give you the facts . . Ask for Catalog 47.

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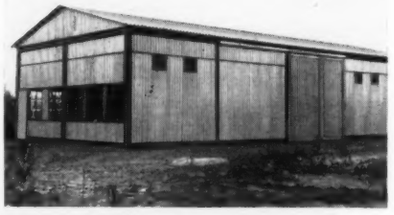
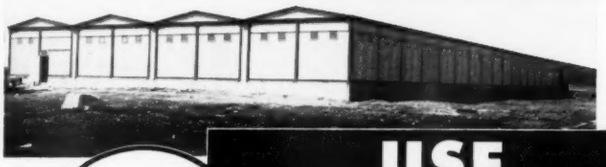
USF's exclusive "clip and wedge" assembly method can save up to ½ the usual erection cost on your building . . . only simple tools required.





- Six types of sidewall panels for complete versatility of design.
- Fully prefabricated—no field fitting, cutting, riveting or welding.
- Weather-tight, vermin proof, fire resistant.
- Permanent, yet easily dismantled for relocation.

USF 12-Foot Clearance Utility Buildings

Ten foot and twelve foot clear span headroom in USF all-steel buildings. Full size flexibility with 26′ and 30′ bay widths arranged for multiple use and any length in multiples of 13′ 6″.

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UNITED STEEL FABRICATORS, INC.

WOOSTER, OHIO

PRODUCTS Hollow Metal Doors • Prefabricated Metal Buildings • Window Wells Highway Guard Rail • Bridge Flooring • Corrugated Metal Pipe

Shell for the base course was dredged from Mobile Bay; then crushed and screened at this processing plant. *U. S. Navy Photo*

way of equal length; intersecting this a short 4,400 north-south runway, also served by a parallel taxiway; and the rough grading for a future dual runway. The second phase of the work includes approximately 120,000 square yards of concrete for an aircraft parking area, and installation of an airfield lighting system.

Eventually the north-south runway will be extended southward to provide another strip at least 8,000 feet in length. Provisions were made in the original design for still another 8,000-foot runway to parallel the newly completed east-west facility.

On July 23, 1951, the Navy awarded an initial contract to Smith Engineering & Construction Co., Pensacola, based on the contractor's low bid in the amount of $6,425,608.

(Continued on next page)

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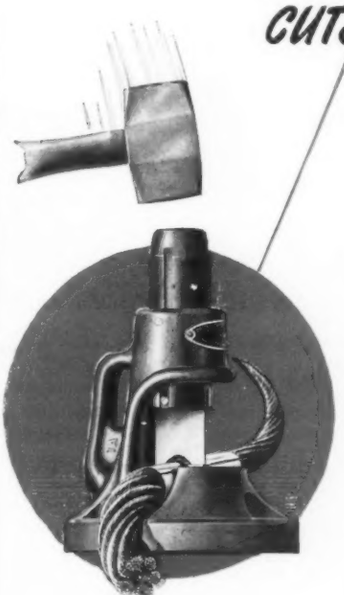

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Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1-1/16 inch, 1½ inch.

SEE YOUR DEALER OR WRITE DEPT. "M"

Morse-Starrett Products Company
1204 - 49TH AVENUE, OAKLAND 1, CALIF.

A Caterpillar No. 12 motor grader spreads out the shell over the subgrade to an average depth of 12 inches.

An 8,000-Foot Runway

(Continued from preceding page)

Construction began immediately, and all runway and taxiway pavement was completed by December, 1952. The remaining construction, including tributary roads and utility services, is scheduled for completion in November, 1953.

Flexible Pavement on Sand-Shell Base

Pavement for the runways and taxiways is the flexible type with the exception of 500-foot sections at the ends of the east-west facilities, and 500-foot sections at the north end of the north-south strips, where reinforced concrete is required. The flexible pavement consists of two 1½-inch courses of asphaltic concrete which is laid on a 12-inch compacted sand-shell base course. Beneath that is a selected native soil subgrade, which is stabilized to a 12-inch compacted depth.

From the center line, the 200-foot runway slopes to the edges on a 1.5 per cent grade. This slope is continued for 150 feet on each side out over the shoulders, which are stabilized to a depth of 6 inches with 15 per cent clay mixed with local sand. Over that goes 2 inches of top soil or muck. The 75-foot taxiways with 50-foot shoulders are treated in the same way. Beyond the ends of the runways, strips 1,000 feet long are cleared, graded, and stabilized in a similar manner.

Grading and Drainage

Parts of the site were heavily wooded, and while the Gulf Coast terrain is fairly flat, the excavation item totaled over 1,000,000 yards. In clearing and grubbing the 934 acres required, the contractor used Fleco root and brush rakes and three dozers mounted on Caterpillar D8 tractors. A few high areas on the site provided enough material to balance the cuts and fills so that borrow was a minor item. In general, the native soil is either sand, or sand in combination with silt, plus some large deposits of muck.

Over 8 miles of reinforced-concrete pipe, 18 to 60-inch diameter, were laid to drain the field. Moretrench wellpoint systems, with 6 and 8-inch pumps on the header lines, dewatered the trenches in advance of the pipe laying. Six excavators on the job were employed primarily as draglines: 3 Bucyrus-Eries—38-B, 22-B, and 10-B; a 605 Koehring; a Bay City; and a Northwest. They dug the drainage ditches or loaded a fleet of 9 bottom-dump Euclids.

Also engaged in the dirt-moving were 4 Super C Tournapulls and 5 Caterpillar DW21 tractors with No. 21 scrapers. Auxiliary equipment included 12 Caterpillar tractors—D8's, D7's, and D6's; 5 Allis-Chalmers HD-19 tractors; 4 Buffalo-Springfield 10-ton rollers—tandem and 3-wheelers; and 4 rubber-tire rollers.

Base Course

To obtain the required 90 per cent modified Proctor density of the subgrade, the native soil was stabilized for a width of 206 feet under the runway. Fines of silty material were brought in and blended into the local sand with Seaman Pulvi-Mixers. From 17 to 20 inches of

GALION LEADS AGAIN!

All Galion Allsteel Dump Bodies are now made of

HIGH TENSILE STEEL!

lighter in weight • stronger

● Effective immediately, the complete Galion Allsteel dump body line of 3 to 27 ton units, will be constructed exclusively of high tensile steel.

Use of this material, previously employed only in special extra-cost, heavy duty bodies will make possible over-all weight savings up to 25%. It will greatly increase payload capacities by cutting down body dead weight to the absolute minimum.

High tensile steel bodies are also far stronger than previously-available standard dump bodies. **High tensile steel has a minimum yield point of 50,000 lbs. per square inch as compared to 25-30,000 lbs. for hot-rolled carbon steel. Consequently body strength is greatly enhanced without adding a single pound of weight.**

OTHER HIGH TENSILE ADVANTAGES

✓ 4 to 6 times greater corrosion resistance.
✓ better paint adherence.
✓ improved resistance to abrasion.

Ask your Galion distributor for additional high tensile body facts—today! He'll be glad to tell you about the Galion Allsteel line—"first" in dump bodies and hydraulic hoists for over 40 years.

A-7728

OTHER GALION PRODUCTS:

Mighty-Mite twin cylinder hoist | Standard hydraulic hoists and bodies | Heavy duty hydraulic hoists and bodies | Telescopic hoists and trailer bodies | Load-evator hydraulic end-loader

THE GALION ALLSTEEL BODY COMPANY • GALION, OHIO

HUNT PROCESS

CONCRETE CURING COMPOUNDS

NOW AVAILABLE IN SOUTHEAST

Write for complete information

HUNT PROCESS CORP., SOUTHERN
RIDGELAND, MISSISSIPPI

Western Factory & Main Office
HUNT PROCESS COMPANY, INC.
7012 Stanford Ave., Los Angeles 1, Calif.

depth were stabilized in order to get the necessary 12 inches of compaction. Tests indicated that the densities obtained in this manner were averaging close to 100 per cent.

Over this special subgrade is a 12-inch sand-shell base course, 202 feet wide, that is compacted to 98 per cent modified Proctor density. The base course contains 70 per cent shell and 30 per cent sand. About 12 inches of shell and 4 inches of sand were spread out on the subgrade and mixed with a Wood Roadmixer pulled by a D8 at the rate of 18 feet a minute. This 16-inch loose depth after rolling compacted to the required 12 inches. Mixing was done in 54-inch lanes.

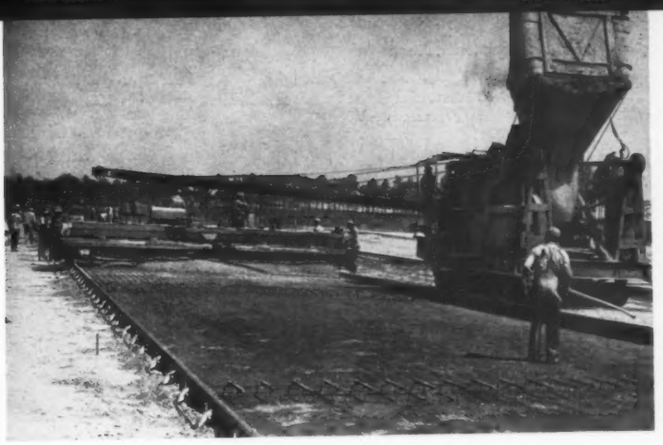
At the 500-foot end sections, the subgrade is also stabilized to a compacted 12-inch depth, but the sand-shell base course is only 9-inch compacted thickness under the concrete. The subgrade was usually left about 4 inches high to provide enough sand for the base course.

Dredged from the Bay

Dead reef shells for the base course were dredged from Mobile Bay by the Radcliffe Sand & Gravel Co. of Mobile, Ala. The material was washed before it was loaded into barges for towing eastward about 50 miles over the Intracoastal Waterway. Shell was unloaded and stockpiled on the bank of the Waterway along the southern edge of the airfield. This accumulation of a shell stockpile was one of the contractor's first steps in the construction. Usually two barges, each holding 750 yards, were shipped daily. After about 80 per cent of the material required was on hand, the processing of the shell got under way.

As it was dredged, the reef shell had a maximum size of about 2½ inches. At the job site it was reduced to a gradation of 1 inch down to No. 4. First, one of the cranes loaded shell from the stockpile into a 40-yard hopper bin that discharged the material over a Robins electric-driven vibrating screen. About 40 per cent of the total material was scalped off for crushing in a 30 x 30 hammer mill. Material was processed at a rate of 200 yards an hour. All shell was collected in a pit, then raised by bucket elevator to storage bins. Bottom-dump Euclids loaded under the bins and hauled the shell to the work areas where it was dumped, then spread out by Caterpillar No. 12 motor graders.

Water was applied to the sand and shell from tank trucks during the mixing, blading, and rolling operations. Optimum moisture was generally between 8 and 10 per cent. A Porter 70 to 80-ton Super-Compactor was an important factor in obtaining the required density in the base course. This big unit was followed by both the rubber-tire traffic rollers and the steel wheel rollers.



Concrete was mixed in this Ransome 34E paver and struck off by the Blaw-Knox spreader. Contraction joints with dowels, in foreground, are spaced on 45-foot centers. Paving lanes are 25 feet wide.
U. S. Navy Photo

Blacktop Work

In preparation for the flexible-type pavement, the base course was primed with a shot of MC-O asphalt, applied at the rate of 0.25-gallon to the square yard by an Etnyre 1,000-

(Continued on next page)

COULTER'S WAGE & TAX *Calculator*

Saves time — up to 50%
Eliminates costly errors — no computing necessary
Relieves eye strain — large type plus color
Write for full information, prices, and sample sheets showing income tax withholding tables.

ENSEE SALES COMPANY
P. O. Box 673— Roanoke, Va.

LoDal will efficiently load, haul, or dump any material suitable for loading. Specifically designed for jobs requiring scattered yardage pickup, LoDal gives a lifting capacity up to 3000 pounds. Simple in design, yet rugged in construction, LoDal may be mounted or demounted in a matter of minutes, allowing your rolling stock to be utilized in other profitable operations. LoDal has been designed for long life with minimum maintenance. Only tested materials of the highest quality are used in its construction, reducing loss of expensive man-hours through mechanical failure. Its heavy-duty construction reduces neither its extreme flexibility nor its ease of operation. With LoDal, loading, hauling, or dumping require but ONE OPERATOR, ONE MACHINE. All action is controlled by ONE LEVER mounted within the cab: push to lower, pull to raise. What's more, expensive minutes are saved by LoDal's speed of operation; units now in the field are loading as high as four yards in three minutes.

For the solution of loading problems requiring POWER, SPEED, ECONOMY, and MOBILITY, look to LoDal. Write, wire, or phone:

TRUCK SELF - LOADERS

V LoDaL INC. NORWAY, MICHIGAN

For efficiency, economy, mobility, power and ease of operation . . . LOOK TO LoDal!

An 8,000-Foot Runway

(Continued from preceding page)

gallon distributor. The same mix was used for the two 1½-inch courses of asphaltic concrete that followed. A pair of Barber-Greene finishers laid the blacktop in 10-foot lanes. After the base course was laid it was given a tack coat of 0.12-gallon of RC-3 asphalt before the surface course was put on. The plant-mix was compacted with Buffalo-Springfield 10-ton tandem rollers.

A Simplicity 75-S asphalt plant, with a 5,000-pound pugmill, was set up on the site. Electrically powered, it was equipped with two dryers and turned out 100 tons of hot-mix an hour. Tanks provided storage for 25,000 gallons of asphalt and 18,000 gallons of bunker C fuel oil for the boiler and driers. Mexican Petroleum Co. supplied the bitumen from its Mobile, Ala., headquarters.

The asphalt cement in the mix is AC-8 with an 85 to 100 penetration, and is 6.5 per cent of the total by volume. Sand for the fine aggregate came from local pits in nearby Lillian, Ala. Slag from the Birmingham Slag Co., Birmingham, Ala., was used for the coarse aggregate; it was graded from 1 inch down. The mix also contained commercial lime dust as mineral filler.

Gradation of the asphaltic concrete—both job mix and specifications—was as follows:

Sieve Size	Per Cent Passing	
	Job Mix	Specifications
1-in.	100	100
¾-in.	98	85–100
½-in.	84	72–87
⅜-in.	64	....
No. 4	53	45–60
No. 10	45	32–47
No. 40	24	16–26
No. 80	12	10–18
No. 200	5.4	4–8

Smith also built an access road, nearly 2 miles long, to serve the new field. It has a 6-inch compacted sand-shell base course composed of 40 per cent shell and 60 per cent sand. Over this is a 1-inch surface course of sand-asphalt mix topped by a bituminous single-surface treatment.

Concrete Paving

Smith subbed all the concrete paving to the Noonan Construction Co. also of Pensacola. The 10-inch pavement for the 500-foot end sections is reinforced with wire mesh placed 3 inches below the surface. It was designed for a strength of 4,000 psi at 28 days. Slag for the coarse aggregate was supplied by the Birmingham Slag Co. The Flomaton Sand & Gravel Co. furnished sand from a pit in Alabama 50 miles away, and the Ideal Cement Co. at Mobile supplied the portland cement. Air-In, an air-entraining agent, was added to each batch at the rate of an ounce per bag of cement to give the mix an air content of from 4 to 6 per cent.

The cement factor was 7.1 bags per cubic yard of concrete, and the maximum amount of water per bag was 5 gallons. Gradation of the coarse aggregate and the sand was:

Sieve Size	Per Cent Passing		
	Slag A	Slag B	Sand
2-in.	100	....	....
1½-in.	35–70	100	....
1-in.	0–15	95–100	....
½-in.	....	25–60	....
No. 4	0–5	0–10	95–100
No. 8	....	0–5	85–100
No. 16	....	....	65–97
No. 30	....	....	25–70
No. 50	....	....	5–35
No. 100	....	....	0–5

Approximate saturated surface dry weights of a 1-bag batch are:

Cement	94 lbs.
Sand	144 lbs.
Slag	294 lbs.

Materials Handling

Bulk cement came in by rail to Corry Field, about 8 miles from the job site. It was unloaded into a Blaw-Knox 300-barrel cement bin, and discharged into a fleet of 8 covered dump trucks that transferred the cement to Forrest Sherman Field. There it was loaded into a Johnson 400-barrel bin.

Slag also came in to Corry Field by rail, was unloaded from the cars to trucks, and transferred to the new base where it was stockpiled alongside an Erie 100-ton 3-compartment aggregate bin. Sand was delivered to the job site by truck. The aggregate storage bin was charged via a conveyor belt, and a dozer that maneuvered around the stockpiles.

Water for the mix came from 4-inch wells, 25 feet deep. It was conveyed a maximum distance of ¾ mile through a 2-inch pipeline to the paver. Hose connections completed the hook-up. Jaeger 3-inch pumps moved the water along from well to paver.

A fleet of 7 trucks hauled three dry batches of 1⅓ yards each from the batch plant to the paver.

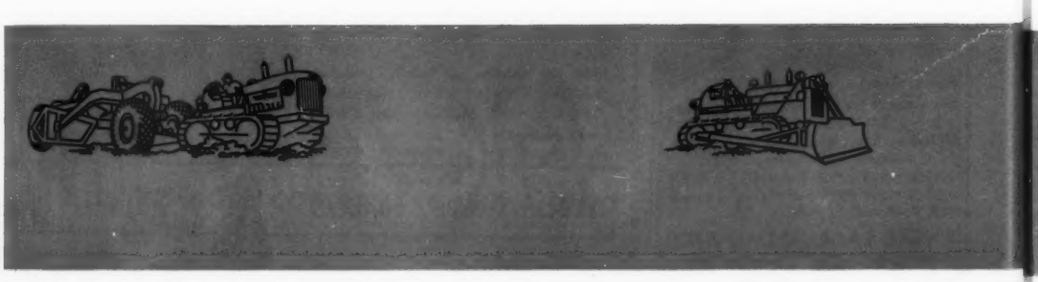
Paving Operations

Concrete was laid in 25-foot lanes between rows of Heltzel forms of which there were 6,000 lineal feet on the job. The Virginia Steel Co. of Birmingham supplied the reinforcing mesh and the load transfer bars at the joints. Contraction joints with dowels are spaced on 45-foot centers, with dummy joints every 15 feet.

Batches were mixed in a Ransome

REMAKING A RIVER BED. The channel of the Arkansas River is being realigned by this fleet of International crawlers owned by the C. W. Kelley Transport Company, Inc., and Rush Construction Company, shown cutting new channel through section of island.

Speeds up Sleepy River



34-E paver, then the concrete was discharged in front of a Blaw-Knox spreader which struck it off 3 inches below the top of the forms. Vibro-Plus vibrators, carried on the spreader, vibrated the concrete along the forms. After the steel mesh was set in place, more concrete was added and a Blaw-Knox 2-screed finisher leveled it off with the top of the forms.

Temporary steel strips for the center longitudinal and the transverse joints were put in from a Flex-Plane machine. Longitudinal screeding was done from a bridge, and was followed by hand floating. A composition belt was pulled over the surface of the concrete to remove any irregularities, and the joints were trued up and edged by the hand finishers. Hunt Process was sprayed on for curing. As a lane was completed, a Koehring crane shifted the finishing equipment to the next lane to be paved. Joints were poured with jet fuel resistant material under a subcontract to the Joint Maintenance Corp. of Lynbrook, N. Y.

Quantities and Personnel

Major items included in this first contract for the construction of runways and taxiways at Forrest Sherman Field were:

Clearing and grubbing	934 acres.
Excavation	1,118,150 cu. yds.
Borrow	150,000 cu. yds.
Muck excavation	369,000 cu. yds.
Open ditch excavation	157,958 cu. yds.
Pipe, 18 to 60-in. RC	42,650 lin. ft.
Shell for base course	314,605 cu. yds.
Bitumen, prime and tack	194,670 gals.
Asphaltic concrete pavement	439,616 sq. yds.
Top soil	2,414,801 sq. yds.
Concrete pavement	71,550 sq. yds.
Steel mesh reinforcing	1,066,000 lbs.

Smith Engineering & Construction Co. worked two shifts on the project and employed an average force of 200 under the direction of M. F. Gonzalez, superintendent. Noonan Construction Co. used around 85 men with Russell Thompson as superintendent.

Administration and supervision of construction is conducted by Comdr. H. F. Winn (CEC), USN, officer in charge of construction, Naval Air Base Training Command, Pensacola, Fla. He is assisted by Lt. C. Lindholm, Jr. (CEC), USN, deputy officer in charge of construction; R. J. Brennan, director of construction; and F. L. Jennings, inspector in charge.

Palmer & Baker, Inc., consulting engineers of Mobile, assisted the officer in charge of construction in the preparation of the plans and specifications for the project, and made the preliminary topographic surveys at the site. Soil surveys were made and local materials evaluated. Test pavements and base courses of various materials were designed, built, and tested. These sections were 150 feet long x 12 feet wide, and the final design was based on the results of the tests.

Surveying and Topography Are Subjects of New Book

The seventh edition of Volume II of "The Principles and Practice of Surveying" by Charles B. Breed, professor of civil engineering, and George L. Hasmer, late professor of geodesy at Massachusetts Institute of Technology, has been published by John Wiley & Sons, Inc.

This newly revised edition is divided into several parts, namely: control of the survey, which discusses geodesy from a practical standpoint; filling in topographic details, dealing with methods of making topographic surveys, including the stadia, plane-table, and photographic method; photogrammetric surveying, which covers stereophotogrammetry, and ground and aerial photogrammetry; hydrographic surveying and stream gaging, discussing common methods of harbor and river surveys; and constructing and finishing maps, which describes the details of making conventional signs.

Tables, charts, diagrams, and photographs are included in all the chapters. The book is available at John Wiley & Sons, Inc., 440 4th Ave., New York 16, N. Y., and sells for $7.00.

Torque Converters

Two new hydraulic torque converters for high-torque medium-speed engines are announced by The National Supply Co., P. O. Box 416, Pittsburgh, Pa. The units cover a power range from 325 to over 1,000 hp. The manufacturer recommends the unit for equipment where hydraulic drive is advantageous in handling continuously fluctuating loads and in starting or accelerating heavy loads repeatedly. Such service conditions are encountered in power shovels, hoists, cranes, and drilling rigs. In this type of service the converter automatically varies the output speed and torque multiplication as the load changes.

Both models, the 29½-inch-type A-295-F and the 34¼-inch-type A-342-F, are mounted on a standard No. 00 flywheel housing and add 36½ inches to the over-all length of the engine.

For further information write to the company, or use the Request Card at page 18. Circle No. 398.

RIVER CROSSING. International crawlers reach islands to start re-channeling work by building earth ramps across the river. They worked in sand and water throughout the summer with no downtime.

CHANGING THE CHANNEL. Operator Kie Bayless says: "These TD-14As have more 'soup' than any other tractor their size. They just plain move more dirt."

International crawlers speed up flow of Arkansas River as safeguard for Kansas wheat belt

Flow of the long and lazy Arkansas River is being speeded up one-third along a 30-mile stretch in Reno County as a flood prevention measure aimed at safeguarding the rich wheat belt in this Kansas County.

When the river rises just six feet, and it does periodically, it spills all over the wheat fields and causes extensive damage.

But county officials feel they have a solution. This year they launched the first portion of a proposed three-year plan involving some $50,000 expenditure each year for elimination of bad turns and islands in the river channel. This improvement will increase the flow of the river from 4.06 feet per second to 5.41 feet per second or more and it is felt this faster flow will be sufficient to keep the river in its channel.

Dirt moving for the first-year phase of the improvement is being handled by Rush Construction Company and C. W. Kelley Transport Company, Inc., with rugged red International TD-18A and TD-14A crawlers.

H. M. Dunsworth, job foreman, reports:

"We lug these TD-18As and TD-14As down all the time. They not only have the power and maneuverability to do a bang-up dirt moving job, but that high-speed reverse sure makes us money on this river job as lots of the dozing calls for long pushes. These Internationals, and some have been used for years, have worked over two months here under miserable conditions with absolutely no downtime."

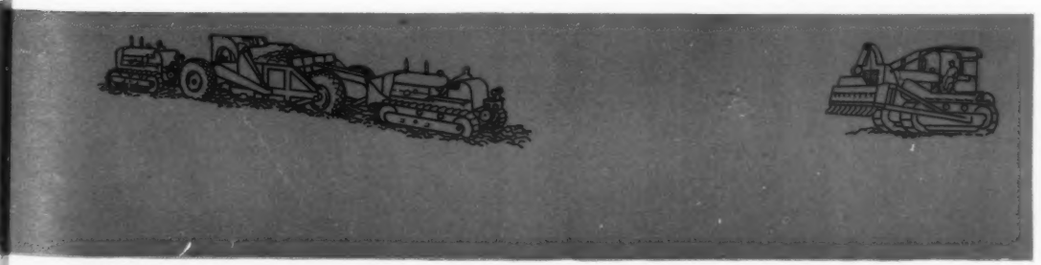
Ask your International Industrial Distributor for details on the whole International line of money-making crawlers. Ask him, too, about his fast, ready service and speedy parts delivery. Get all the answers . . . you'll want International "Power that Pays" from now on!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS



Wall Coping and Fittings

An 8-page booklet gives details on a line of wall coping and fittings made by The Evans Pipe Co., 25 Newport Ave., Uhrichsville, Ohio.

The Super Weather-Tight wall coping has interlocking ends and side lugs that are sealed into the mortar to keep water from creeping up underneath the coping.

Copings are available for all widths from 9 to 18 inches, in lengths of 6 to 30 inches.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 412.

PREFERRED by CONTRACTORS

Less initial cost — Lower upkeep

MARVEL

CONCRETE VIBRATORS

1½ HP to 5 HP

GV-1, GV-2 & GV-3 MODELS NOW EQUIPPED WITH AUTOMATIC CENTRIFUGAL CLUTCH AS STANDARD EQUIPMENT. INTERCHANGEABLE FLEXIBLE SHAFTS.

Write for full information

MARVEL EQUIPMENT CORPORATION

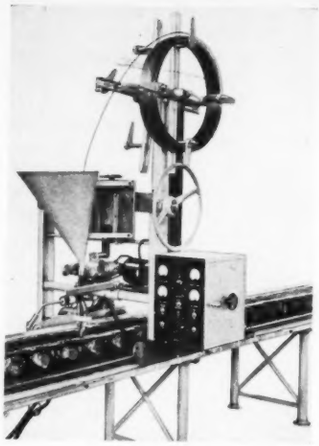
215-217 EAGLE ST. • B'KLYN 22, N. Y.

Welder and Positioner

A new welder and positioner is said to do automatically many welding operations previously done by hand. Recommended uses for the Rexarc welder include rebuilding track rails, rollers, grousers, scraper plates, shovel dipper sticks, trunnions, box beams, structural shapes, sparrow feed screws, crusher rolls, mandrels, and shells.

The equipment has provision for both low and high-voltage welding. Other features include high-frequency starting and stabilization to get a steady arc, and control over low-arc voltage and amperage to minimize stress and dilution of parent metal.

Welding can be linear or cross-bead, continuous or in sequence, on flat or circular shapes. The head is transferable and can be moved from



one position to another. The rotating spindle adjusts to accommodate a large range of work sizes for welding shafts, rollers, sheaves, idlers, and similar circular surfaces. A hydraulically controlled elevating device permits angular positioning. Supporting trunnions are available for welding on long circular work.

The machine has an arc of 18 to 20 volts and 350 amps to avoid excessive dilution with the parent metal so that one-pass welds do not produce a metallurgical change in the deposit. To accomplish this a high-frequency generator with an arc-voltage adjustment is provided in addition to the standard 500-amp transformer-type welder.

For further information write to the Sight Feed Generator Co., West Alexandria, Ohio, or use the Request Card at page 18. Circle No. 466.

TIMKEN® bearings now used on bevel pinions of Caterpillar DW20 high speed tractors

BIG payloads—hauled at high speeds. That's one big feature of Caterpillar's DW20 tractors. Another: the Timken® tapered roller bearings now being used on the tractors' bevel pinions.

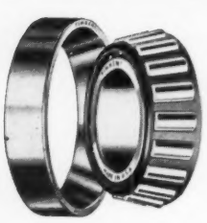
Timken bearings easily carry the tractors' heavy pinion loads. Line contact between their rollers and races provides load-carrying capacity to spare.

Because of their tapered construction, Timken bearings take radial and thrust loads in any combination. They hold pinions in alignment, insure accurate gear meshing and a smooth flow of power. Their true rolling motion and incredibly smooth surface finish practically eliminate friction. Tractors stay on the job—with the help of Timken bearings.

Timken bearings keep housings and shafts concentric, making closures more effective. Lubricant is kept in—dirt and moisture kept out. Maintenance costs are reduced. Next time you build or buy construction machinery, get top value by making sure the bearings are stamped with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

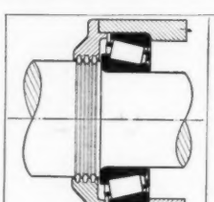
How CATERPILLAR mounts the bevel pinion of its DW20 tractor on Timken bearings to provide long life and trouble-free performance.



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



LUBRICANT STAYS IN —DIRT KEPT OUT

Because Timken bearings hold shafts concentric with housings, closures are made more effective. Lubricant is retained, dirt and moisture kept out.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

New Mobile X-Ray Unit

A new 250-kv mobile x-ray unit for radiographing unwieldy objects that require positive inspection is available from Westinghouse Electric Corp., Section X, 2519 Wilkens Ave., Baltimore 3, Md. The manufacturer reports that improvements in the new model are principally in flexibility and ease of handling. The operator has been given additional protection and can stand inside the cab. The radius of turn has been improved so that the unit can be more easily positioned.

The minimum tube-head-to-floor distance is 36 inches and the maximum 108 inches. The tube-head has a horizontal travel of 48 inches. The vertical column can be rotated 360 degrees.

The apparatus can radiograph up to 4½ inches of steel.

For further information write to the company, or use the Request Card at page 18. Circle No. 400.

Mastic-Floor Resurfacing

A new brochure describes cold-applied asphalt flooring that can be used as a new surfacing for old concrete or wood floors, or as an underlayment for leveling floors before applying tile and linoleum. The literature gives details on mixing including all necessary proportions of ingredients. Results are given of compression tests, fire tests, and slip and friction tests made on the material.

To obtain this literature write to United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, Ohio, or use the Request Card at page 18. Circle No. 406.

Fills Grease Guns

A new dispenser that fills grease guns has been introduced by K-P Mfg. Co., 1220 Linden Ave., Minneapolis 3, Minn. The GFD-400 handles any grease gun equipped with a filler plug or that requires removal of the gun head for filling.

Guns with a filler plug in the head are filled with several strokes of the gun handle. Guns not tapped for a filler plug, but having a removable head, are attached to a plug on the side of the dispenser and filled with a few strokes of the dispenser pump handle.

The dispenser fits all straight-side wall pails. A follower plate compresses light or heavy greases down uniformly. Grease is pumped into the gun without air pockets in either pump or gun.

For further information write to the company, or use the Request Card at page 18. Circle No. 422.

Motor Reference Booklet

A motor and generator reference booklet that helps to select motors for various applications is offered by Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

The booklet explains differences in characteristics of the various types of motors available. A table gives recommendation for ac and dc units for rock crushers and hammermills, cement kilns, conveyors, cranes, hoists, winches, compressors, and pumps.

The 50-page pamphlet is reprinted from the 1952 edition of Lincoln's Industrial - Commercial Electrical Reference published by the Electrical Modernization Bureau, Inc.

To obtain this literature write to the company, and request 51R7933, or use the Request Card at page 18. Circle No. 453.

Minneapolis-Moline News

Two appointments have been made at Minneapolis-Moline Co., Minneapolis, Minn., manufacturer of engines and tractors.

W. C. MacFarlane, Jr., vice president, has been appointed director of manufacturing in addition to his other duties; since 1950 he has been in charge of all Government contracts for the company. W. H. MacFarlane, manager of the company plant at Louisville, Ky., is named coordinator of engineering. He was named a director of the company in 1952.

Concrete-Curing Compounds

A line of membrane-forming concrete-curing compounds is discussed in literature from the Servicised Products Corp., 6051 W. 65th St., Chicago 38, Ill.

The literature covers four types of curing compounds. Pigmented compounds which are made in white and gray provide a film or membrane that reflects heat. This type is recommended for atmospheric temperatures that exceed 80 degrees F. Clear curing compounds are available in both wax-resin and resin-base types. Both of these can be supplied with a fugitive dye which helps to secure proper coverage and disappears shortly after application. Clear compounds are used when the natural color of the concrete is desired.

Three compounds are made for tilt-up or precast-concrete construction. These are used to separate the form base from the concrete pouring and may be had in a type that disintegrates after a time so that the wall may be painted or receive further treatment.

The company also offers a black low-cost compound used to cure building floors which will be covered, and slabs and exterior walls which will be backfilled. It is also used in cold climates when a higher temperature is required for proper curing.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 423.

Heavy-Duty POWER CORDS

ALL RUBBER . . . FLEXIBLE. Made of rugged military cordage approximating civilian
2 Conductor #14

Complete with cord clamp, spring action plug and heavy duty female connector.

Also 100-Ft. Set 2 cond. #12 POSTPAID. **$15.50 ea.**

100-Ft. Set only POSTPAID. **$9.95 ea.**

Kingsdown Cable & Wire Co., Cords Dept., 4540 W. Addison, Chicago 41, Ill.

Simplified Concrete Forming System
for Lowest all around Form Costs!

3 BASIC ELEMENTS

UNI-FORM Panels
Prefabricated . . . ready to use when they reach your job.

UNI-FORM Tie
Locks, spreads and ties . . . absolutely accurate.

UNI-FORM Tie Key
Wedge-Shaped for fast, easy insertion.

3 SIMPLE OPERATIONS

1 Place the Uni-Form Tie Loop into the Tie Hole.

Set the Tie Key into the Tie Loop. Panel and Tie are then locked into one integral unit. 2

3 Bring the next UNI-FORM Panel into position . . . insert the Tie Key. The assembly is now completed.

UNI-FORM® Panels Assure Faster Erection . . . Automatic Accuracy

ALIGNMENT ON 1 SIDE ONLY!

FREE Engineering Service!

Complete job analysis . . . forming recommendations, bills of material supplied by our staff of experienced engineers... **PLUS**... Field Service... anywhere... anytime to insure proper starts and maximum economy on your job. Send us a set of plans for FREE estimate. No obligation.

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Left to right: J. D. Bucher, resident engineer, Howard, Needles, Tammen & Bergendoff; R. D. Bleich, general superintendent, and Jerry Engelhart, field engineer, Kansas City Bridge Co., and Massman Construction Co.
Houck Photo

Self-Anchored Bridge To Span Missouri River

The Paseo, First Suspension-Type Across Big Muddy, Will Have 56-foot Roadway

• CONSTRUCTION has begun on the first suspension bridge across the Missouri River, and the longest self-anchored bridge in the United States with the widest roadway.

The Paseo Bridge at Kansas City, Mo., located almost a mile downstream from the Armour, Swift & Burlington Bridge, is part of a $16,000,000 expressway, and the fourth bridge in the area. A joint project of Jackson and Clay counties, it is financed by 30-year bonds.

Traffic is scheduled to cross April 28, 1954, and future contracts for approaches and viaducts will meet the main bridge completion date.

Four river piers located between levees are based on bedrock while other foundations including railroad viaducts are founded on piling.

Expressway Details

The bridge is a part of a 3.3-mile divided 4-lane limited-access expressway, beginning on the north side of the river at Armour Road and connecting on the south side with The Paseo at one point and with the proposed 6th Street Trafficway at another point.

Heading north from the southern extremity, the two south legs join the main expressway at Lexington Avenue and then cross the railroad tracks of the Kansas City Terminal, Missouri Pacific, and Kansas City Southern, over a 1,390-foot viaduct (Bridge No. 8) which has its north end connected to main river spans by a 980-foot embankment.

The 1,800-foot main river bridge has one 616-foot center span and two 308-foot side spans, 55 feet above high water.

A 1,870-foot embankment forms the northern approach and then the route passes over the Wabash and C. B & Q. railroad yards on a 1,440-foot viaduct to reach a terminus at 14th and Linn Streets. A traffic interchange at 16th Street feeds the densely populated and industrialized North Kansas City and the expressway continues north to Armour Road where there are separation and interchange facilities. The Missouri State Highway Department will relocate U. S. 69 and U. S. 71 from the north to connect with the project at Armour Road.

A 4-foot median strip will separate 26-foot roadways on the bridge and viaducts with 3-foot safety walks along both curbs. While embankments will have 24-foot roadways separated by a variable median, and underpasses will have 24-foot lanes with 4-foot medians, both have 10-foot outside shoulders. The project complies with AASHO design standards for interstate highways.

Howard, Needles, Tammen & Bergendoff, Kansas City and New York, N. Y., designing engineer, predicts that as a toll bridge, 31 per cent of the traffic will be attracted and that as a future free bridge, 59 per cent of the total crossings will be attracted.

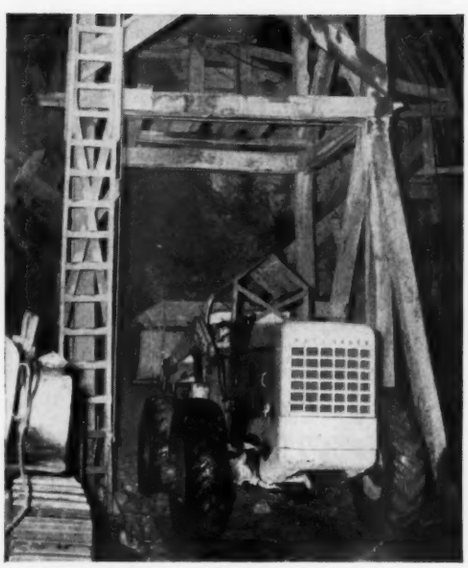
Contracts

Kansas City Bridge Co. and Massman Construction Co., both of Kansas City, are joint-venture contractors for four river piers at $2,182,360 and started work Oct. 20, 1952. On March 2, the job was on

SPEEDY STABILIZING — "PAYLOADER" tractor-shovel breaks lumps with its bucket as it pulls a double sheepsfoot at a 4 mph pace to compact highway fill.

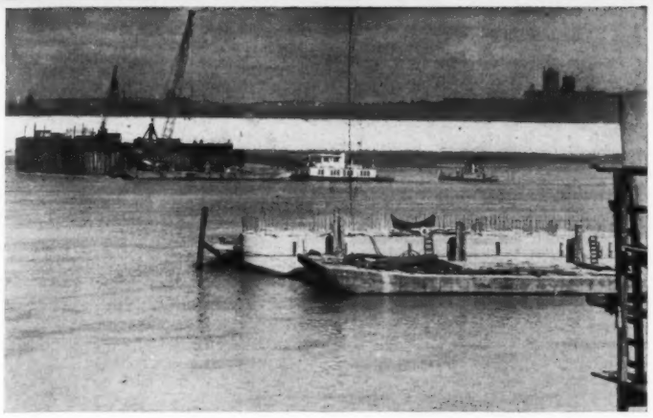
CONSTRUCTION *Pictorial Review*

MIGHTY MOLE — They wanted a cellar under a factory building, so a 12 cu. ft. "PAYLOADER" tractor-shovel did the job with speed and satisfaction.



TUNNEL DRIVER — 4-wheel-drive "PAYLOADER" tractor-shovels help Bates & Rogers Construction Corp. muck railroad tunnel — also lifted forms and handled roadbed ballast and aggregate for concrete lining.

IN THE TRENCH — Here's a "PAYLOADER" with Crane Hook attachment right in the trench spotting 60" sewer pipe for the setters. It also graded and backfilled on this big sewer construction job at Denver, Colo.



Piers No. 4 (foreground) and No. 3 which will support the towers for the new Paseo bridge suspension span. *Houck Photo*

schedule and 37 per cent completed. Piers 3 and 4 were scheduled for completion in 240 days, Pier 2 in 270 days, and Pier 5 in 300 days.

The superstructure contract was let January 15, 1953, to the American Bridge Division, U. S. Steel Corp., New York, for $4,990,272 which was about $1,000,000 over the estimate. Superstructure is to be completed in 450 days. Bids for South Viaduct (Bridge No. 8), North Viaduct (Bridge No. 9), and grading for the entire job were received on March 17. Bids for Bridges Nos. 1 and 11, and Bridges Nos. 1, 2, 6, and 7 were received in June and July and contained these quantities:

Item	Quantity
Structural steel	4,973 tons
Reinforcing steel	1,621 tons
Steel castings	133 tons
Piling	345,000 lin. ft.
Concrete	18,100 cu. yds

Bids for 50,000 square yards of concrete paving south of the river and 40,000 square yards north of the river will be received in August.

Grading will be let in four contracts and totals 1,660,000 cubic yards, with compacted or hydraulic fill optional on 300,000 cubic yards, while the balance will be compacted fill.

Everham-Aldridge Co. started approach borings on January 21, 1953, and when visited by CONTRACTORS AND ENGINEERS had completed the South Viaduct.

Raymond Concrete Pile Co., New York, bored 17 bridge foundation holes, starting August 13 and finishing September 13, 1952.

Prepares for High Water

High water which usually comes down the cantankerous Missouri in apple-blossom time, had no fury for R. D. Bleich, seasoned river-wise general superintendent. Having figured its arrival to coincide with the time they "put the air" on the caissons he had planned to outwit the river with a floating power plant instead of a bank-based air supply.

Workmen put the finishing touches to his barge-mounted power plant late in February. Four 630-cubic-foot Joy compressors powered with Caterpillar diesels were installed to supply the heavy demand for 50-pound air for pneumatic excavation.

Building Piers

The first step was to drop 32-foot breakwater towers in the river above the piers with one of the floating rigs with 100-foot booms. Every tower was anchored with 70-foot spud pilings in each corner. Steel sheet piling was driven between the towers to break the current which, because of the low river stage, was only 5 mph in the channel. Starting the job at a low river stage was an advantage.

Piers 2 and 5, nearest the banks, had two cylindrical caissons each, 22 feet in diameter on 69-foot centers. Caissons had 4-foot walls and 14-foot-ID dredge wells when based 5 feet in blue shale, the regional bedrock. No. 2 will be 92 feet below a 20-foot river stage (standard high water), to elevation 643 feet, and No. 5 will be 119 feet. Top elevation was 752 feet. Piers 2 and 5 which were 18 x 87 feet at the top, were 109 feet and 136 feet high respectively.

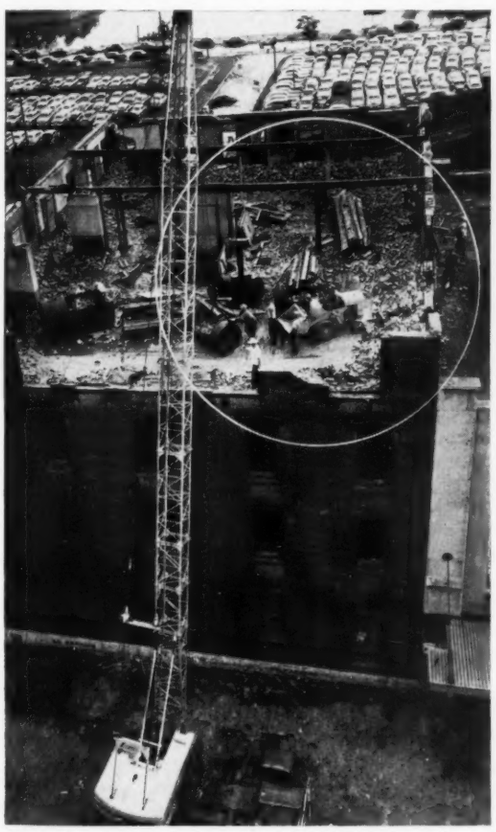
Piers 3 and 4 which support the tower columns will be 20 x 98 feet at the top with concrete pads for tower columns at elevation 752. No. 3 will be 108 feet 6 inches high and No. 4, 114 feet. These piers had 20 x 98 feet caissons each with 4½-foot walls and five 11 x 15-foot dredge wells.

Two floating rigs with 100-foot booms and 1½-cubic yard clamshells were used to clam the sand from the dredge wells as the steel-faced cutting edges grind their way down to rock. A 1¼-yard clamshell was used when the openings

(Concluded on next page)

DAM ROCK— This 1½ yd. 4-wheel-drive "PAYLOADER" stockpiled and loaded 40,000 yds. of rip-rap rock to help speed the construction of Shadehill Dam in South Dakota.

SEWER BUILDER — The 1¼ yd. "PAYLOADER" was an all-around busybody on this sewer job. It loaded excess dirt, carried the pipe, backfilled the trench and pulled sheathing.



HIGH FLYER— Down comes the building with the help of a 12 cu. ft. "PAYLOADER". Lifted to the top floor by a truck crane, it scoops up brick and other debris, carries and loads them into skips for the crane.

CUTS BRICK COSTS— 4-wheel-drive "PAYLOADER" with forks places pallets of bricks handy for the layers — saves handling and breakage — greatly reduces brickwork costs.

THE FRANK G. HOUGH CO.
762 SUNNYSIDE AVE.
LIBERTYVILLE, ILLINOIS

Please send data on PAYLOADER Sizes checked:

1½ yd. ☐ 1 yd. ☐ ½ yd. ☐
1¼ yd. ☐ ¾ yd. ☐ 12 cu. ft. ☐

Send me the name of my PAYLOADER Distributor ☐

NAME_____

FIRM NAME_____

STREET_____

CITY_____ STATE_____

Self-Anchored Bridge To Span Missouri River

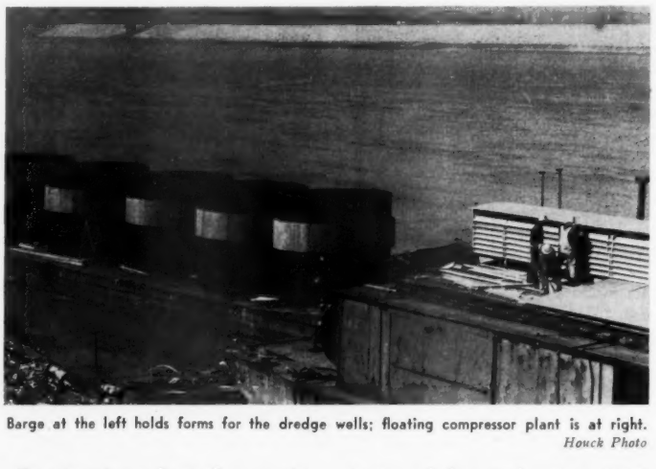
(Continued from preceding page)

were reduced to 8 feet.

Concrete

Concrete was supplied in transit mixer trucks by the Stewart Sand & Material Co., but was premixed at the plant for extra uniformity and more rigid control over the 2½-inch slump. Premixing was 2 minutes in a plant-based 3-cubic-yard Smith mixer. Mix is 6-sack, 5½ gallons of 140 degree water to the sack, maximum aggregate 1 inch, and concrete temperature of 74 degrees.

Seven-day strength was 2,500 psi and 28-day strength was 3,800 to 4,000 psi. Forms were stripped in 18 to 24 hours except on cutting edge pours which were not stripped for 7 days. Cutting edge pours were made by use of a steel sheet pile retained-sand island around each pier which was removed as the succeeding sections started down.



Barge at the left holds forms for the dredge wells; floating compressor plant is at right. *Houck Photo*

Transit mixers kept the premix turning between plant and job, backed in to a dock on the river band, and chuted their loads to three 2-yard concrete buckets on each barge. The barges were towed to the pour site by two tug boats, where loaded buckets were handled by floating rigs. Most pours were made at the rate of 60 cubic yards per hour.

Pours were made in 9-foot lifts using special forms of steel made by the Kansas City Structural Steel Corp. These re-usable steel forms were made with a 3/16-inch skin plate reinforced with 3/8 x 6-inch welded web.

The 9-foot sections sank at the rate of 6 to 12 inches per hour until the cutting edges reached the stiff going in the varicolored coarse sand and gravel mixed with silt which lies just above the blue shale.

The low stage of the water was an aid to the sinking. There was little shifting of the caissons and almost no unexpected happenings. The west cylinder of Pier 2 shifted south and west and located itself on a 4-inch radius of plan position but within the tolerance. Pier 3 also developed a slight skew but well within the tolerance.

Pier 3 hit an unscheduled 6-foot stratum of clay at elevations 695 to 689 which, not having shown up on boring logs, was excavated.

Thirty pours were made on Piers 3 and 4 with two sets of forms and 22 pours on other piers.

Equipment

Kansas City Bridge Co. and Massman Construction Co. have the following equipment on the job:

1 Bucyrus-Erie 38-B dragline, 65-ft. boom
1 Floating American Revolver crane, 100-ft. boom
1 Floating Lincoln-Dayton rig, 100-ft. boom
1 Bucyrus-Erie 38-B dragline, 75-ft. boom
1 Floating pontoon derrick, 65-ft. boom
1 Gardner-Denver 210 cu. ft. air compressor
1 Gardner-Denver 105 cu. ft. air compressor
1 Tugboat, "Bulldog" 14 x 42 ft.
1 Tugboat, "E. Frakes" 18 x 66 ft.
1 Tugboat, "Katherine" 14 x 42 ft.
1 No. 2 Vulcan pile hammer
2 9-B-3 McKiernan-Terry pile hammers
1 No. 7 McKiernan-Terry pile hammer
2 No. 400-A Vulcan pile extractors
4 630 cu. ft. rotary compressors
5 24 x 10-ft. Steel barges
1 36 x 130-ft. Steel barge
3 15 x 40-ft. Pontoon barges
1 21 x 46-ft. Sectional pontoon barge

Quantities and Personnel

Materials used on this job were:

Steel sheet piling	22,240 lin. ft.
Concrete, Class 30	18,200 cu. yds.
Reinforcing steel, substructure	420 tons
Steel, structure and superstructure	6,616 tons
Concrete, superstructure	3,600 cu. yds.

For the Kansas City Bridge Co. and the Massman Construction Co., J. J. Boyl is office engineer; Jerry Engelhart, field engineer; and R. D. Bleich, general superintendent.

For Howard, Needles, Tammen & Bergendoff, R. N. Bergendoff is partner in charge of engineering, and J. D. Bucher is resident engineer.

Marked Plastic Pipe

A new flexible plastic pipe is marked at exact 10-foot intervals with its trade name, Plastex, so that lengths can be measured out easily. According to the manufacturer, accurate measurements to a fraction of an inch can be made with a pocket rule. A further advantage of the marking is that it makes possible a quick inventory of partly used coils.

The plastic pipe is made of polyethylene and is non-toxic. Recommended uses for the pipe include wells, water systems, drainage, irrigation, gas, air, and pure or corrosive liquid-processing lines. Pipe sizes are from ½ to 6 inches. A complete range of fittings for making any connection is available.

For further information write to The Plastex Pipe & Extrusion Co., 402 Mt. Vernon Ave., Columbus 3, Ohio, or use the Request Card at page 18. Circle No. 379.

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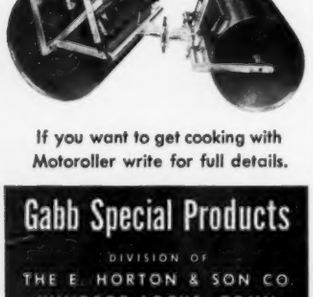
More small rolling jobs per day are easy as pie with Motoroller. Load it on a light truck and it's on and off the job before you can get the heavy equipment warmed up.

And with more jobs per day you'll cut yourself a bigger slice of the profit pie.

Use Motoroller for the trimming on big jobs, too—ideal to roll confined areas without hand tamping and to roll out laps left by larger equipment.



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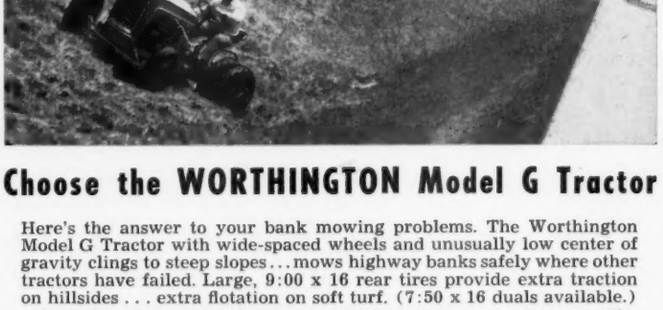

Choose the WORTHINGTON Model G Tractor

Here's the answer to your bank mowing problems. The Worthington Model G Tractor with wide-spaced wheels and unusually low center of gravity clings to steep slopes... mows highway banks safely where other tractors have failed. Large, 9:00 x 16 rear tires provide extra traction on hillsides . . . extra flotation on soft turf. (7:50 x 16 duals available.)

High travel speed holds non-productive time to a minimum. The Worthington Model G goes from one job to another at highway speeds up to 40 mph.

The Model G is far more than a sickle mower tractor. Working with the famous Worthington Gang Mowers, it becomes a part of the most efficient combination available for maintaining long stretches of grass.

Write for complete information on the Model G Tractor or see your Worthington dealer.

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STROUDSBURG, PENNSYLVANIA

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Exclusive Distributors For The FINEST in Construction Equipment

- ALLIS-CHALMERS—Diesel tractors, motor graders, motor scrapers.
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- GAR WOOD MANUFACTURING CO., scrapers, dozers, power control units.
- TRACTOMOTIVE CORP., hydraulic loaders.
- AMERICAN hoists, derricks, diesel electric cranes.
- CHICAGO PNEUMATIC TOOL CO., compressors, air tools, electric tools.
- LINK-BELT SPEEDER CORP., shovels, cranes, draglines.
- SCHIELD BANTAM, ⅜-yd. shovels, cranes, backhoes.
- T. L. SMITH CO., truck mixers, concrete mixers, agitators, industrial mixers.
- SKILSAW, INC., portable electric tools.

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Phone ANgelus 1-9141

SAN DIEGO
2127 Newton Ave.,
Phone Franklin 9-4145

Bar and Channel Shear

A machine for cutting bar and channel stock is the latest addition to the Guillotine line of hydraulic cutting tools made by Manco Mfg. Co., Bradley, Ill. Model 20-339, has a cutting capacity up to ½ x 2 inches of flat bar stock or channels to 9/16 x 2 x 3/16 inches.

The machine is powered by a ½-hp electric hydraulic pump; 30-ton thrust is provided. Weight of the pump unit is 80 pounds, and of the shearing unit 48 pounds. For non-production applications and on-the-job cutting the machine can be obtained with a manually operated hydraulic pump weighing 13 pounds. The assembly can also be had dolly-mounted.

For further information write to the company, or use the Request Card at page 18. Circle No. 373.

Cord-Type Conveyor Belt

A conveyor belt with cord-type reinforcement is shown in literature from Raybestos-Manhattan, Inc., Manhattan Rubber Division, Passaic, N. J. The cords in the Homocord belt are impregnated and imbedded in a flexible matrix to absorb impact. This construction adds impact strength and also guards against mildew. A further feature is that the belt holds metal fasteners. It can be spliced and vulcanized in the field.

The belt is offered in 2 types: one for more severe service such as the handling of boulders, and one for handling rock and gravel. The conveyor can be made oil-proof, non-sparking, and heat resistant, and with breaker fabric under the covers for special conditions.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 464.

Schmid Elected President

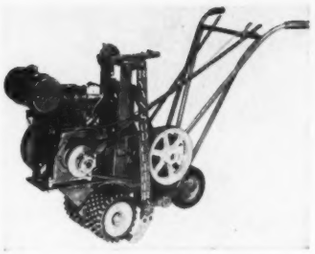
Donald M. Schmid, assistant general manager of sales, Truscon Steel Division, Republic Steel Corp., Youngstown, Ohio, has been elected president of the Wire Reinforcement Institute for 1953. He has served as vice president and a member of the board of directors.

Other officers elected include Walter H. Leo, manager of sales, Construction Projects Division, Sheffield Steel Corp., Kansas City, Mo., who became vice president; and Frank B. Brown, managing director of the Institute, with offices in Washington, D. C., who was re-elected treasurer.

Power Sod Cutter Has Knobby Drive Wheel

A new power sod cutter that has a knobby-tread drive wheel made of rubber vulcanized to a steel core is announced by K & N Machine Works, 871 Edgerton St., South St. Paul, Minn. The Model 5 sod cutter travels at the rate of 100 fpm with a 6-hp gas engine. It is rated by the manufacturer at 4,000 to 5,000 square yards of sod cutting a day. The oscillating steel blade is said to cut without pulling, tearing, or fouling with roots.

Blade adjustment regulates thickness of cut from ½ to 2½ inches.



The new drive wheel is said to dig in and hold on wet turf and slippery hillsides.

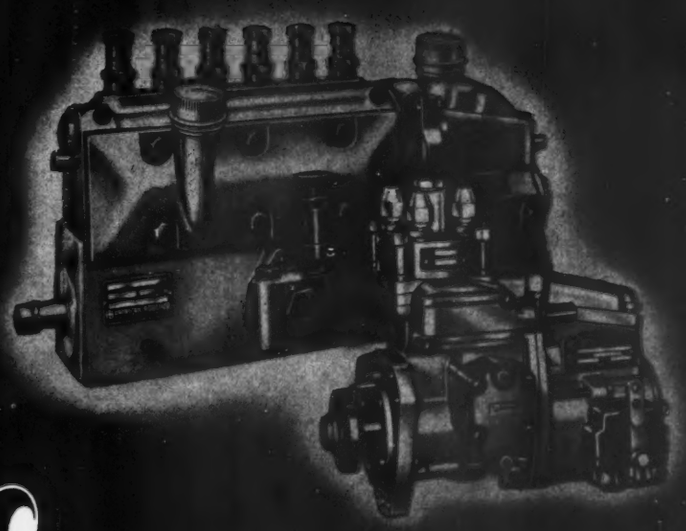
For further information write to the company, or use the Request Card at page 18. Circle No. 443.

Excavators and Cranes

Three new specification booklets give information on the Gar Wood ¾-yard Model 75A and Model 75B excavators and the 75BT truck cranes. Data includes capacities, ranges, reaches, travel speeds, and attachments available for all three models. Also included are descriptions of the company's foundation borer, a new right-angle drive, and power plants.

For further information write to Customer Service Dept., Gar Wood Industries, Inc., 36253 Michigan Ave., Wayne, Mich., or use the Request Card at page 18. Circle No. 465.

AMERICAN BOSCH



first in diesel fuel injection

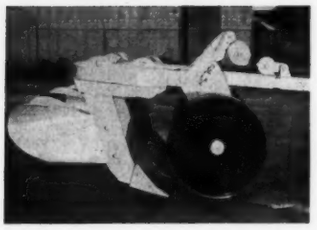
First in the past, first today, first in the future . . . because American Bosch knows more about diesel fuel injection than any other manufacturer.

Haynes Elected Director

John L. Haynes, former director of the Building Materials Division of the National Production Authority, has been appointed managing director of the Producers' Council, national organization of building-products manufacturers.

In his new post, Mr. Haynes will direct its comprehensive promotional and educational activities and its joint programs with the American Institute of Architects, National Association of Home Builders, National Retail Lumber Dealers Association, Associated General Contractors, and other construction industry groups.

Mr. Haynes, connected with construction for 27 years, was chief of the Construction Division of the U. S. Department of Commerce for several years prior to his assignment with NPA.



At left, the Model M-87-A Murray scraper behind a TD 14-A International tractor. Above, a Murray 7-shank rooter with four shanks mounted.

Scrapers and Rooters

A line of carrier-type and drag scrapers is made by Murray Mfg. Co., 510 River Road, Modesto, Calif. Heaviest of the line is a 7¼-yard-capacity unit. Model M-87-A has an 8-foot cutting edge with 3-piece drop center and a reversible blade. This model, which requires 45 to 65 hp, has hydraulic controls.

A 5¼-yard model, the M-85-S, is designed for long-haul work with any wheel tractor. This unit has dual rear wheels and a blade with an 8-foot cutting edge.

A lightweight scraper, Model M-63, has a capacity of 3¼ yards heaped and 2¼ yards struck. Cutting edge is 6 feet.

Model M-74, an all-purpose unit, has a short turning radius and high blade and apron clearance which are said to make it effective in restricted areas and on rough ground. Horsepower requirements for this unit are 30 to 40. Heaped capacity is 4¼ yards and struck is 3½ yards. Cutting edge is 84 inches.

The company also makes a drag scraper or land leveler, available in 6 to 12-foot sizes.

A line of rooters is available in cable and hydraulic-control models. Shanks as well as the plow-steel shank teeth are removable. The rooters may be had with steel wheels or rubber tires.

For further information write to the company, or use the Request Card at page 18. Circle No. 447.

Galion Appoints Tiller

J. H. Tiller has been appointed assistant sales manager of Galion Iron Works & Mfg. Co., Galion, Ohio, manufacturer of construction equipment.

Until his recent appointment Tiller was Galion's district representative in the south central area.

FAST AND CLEAN DISCHARGE of even the lowest slump concretes is made possible by the patented blade design of this Worthington Hi-Up Truck Mixer, one of a fleet owned by the McNamee Ready Mixed Concrete Co. of Xenia, Ohio.

"Drivers, shop men, customers—everybody likes our new Worthington HI-UP Truck Mixers"

Says Charles F. McNamee of the McNamee Ready Mixed Concrete Co., Xenia, Ohio

McNAMEE DRIVERS LIKE THE HI-UP because its unrestricted hopper opening keeps charging time to a minimum. Both charging and mixing are accomplished with the drum rotating in the same direction. And the engineered weight distribution of the Hi-Ups lets you carry the maximum legal payload.

Mr. McNamee goes on to say:

"We particularly like our new Blue Brutes' heavy-duty transmission and their ease of operation. Our shop men like the provisions for easy maintenance; for example, they point out the relatively few lubrication points and their ready accessibility. The drivers say the machines are unusually easy to handle and to keep clean, that they mix and discharge exceptionally well. But what makes us happiest of all is that the machines and their product are liked by our customers."

We've been getting letters like this from Worthington Hi-Up Truck Mixer users all over the country. Why not find out for yourself about these modern Blue Brutes. Get the facts from your nearest Worthington distributor, or write directly to Worthington Corporation, Construction Equipment Division, Section R.3.6, Plainfield, N. J.

R.3.6

WORTHINGTON

IF IT'S A CONSTRUCTION JOB, IT'S A **BLUE BRUTE** *JOB!*

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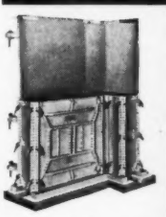

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When placing concrete, use this nationwide Form Rental and Engineering Service to increase profits, reduce costs.

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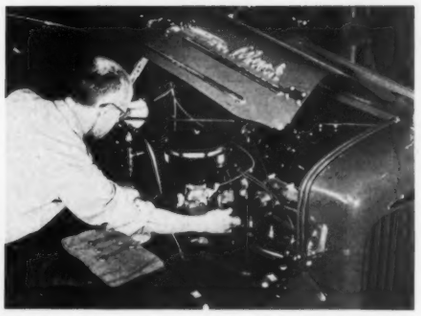


The Model B42T, at left, typifies the new Mack B Series tractors. Accessibility, as shown above, is a feature.

New Line of Trucks

A new Mack truck-tractor line includes vehicles in four and six-wheel types, covering a range from 17,000 pounds gvw through 70,000 pounds gcw. The new B series Macks are powered by gasoline or diesel engines.

The manufacturer states that high payload capacity within legal limitations has been achieved through a reduction in chassis weight. Frames are fabricated from lighter steel alloys than previously and weigh considerably less. Axle banjos, transmission cases, and wheels are all lighter.

Styling features a short hood, bumper, and radiator. The engine is mounted well over the front axle to reduce the distance from front bumper to back of cab. Applied to tractors this design permits use of maximum-length trailers within the 45-foot over-all length limit. In a truck it also accommodates larger bodies.

Accessibility for service and routine maintenance has been made easier with more working space available around the engine despite compact design. Instead of the conventional dashboard cave which makes the rear of most engines virtually inaccessible, the new design has an open-top bay covered only by the hood which extends the full length of the engine. With hood raised, the entire engine top is exposed. Other detachable panels expose the sides of the engine.

New Mack engines offer a complete power range up to 170 hp. Two Mack diesel engines are available as options in the 138 and 170-hp class.

The truck line also has new transmissions and new axles. Single reduction axles drive through hypoid gears. Dual reduction axles drive through spiral bevels. Double-reduction 2-speed axles are also available.

The cab construction stresses driver comfort and safety. The driver sits high for good visibility. Large door windows and wide V-type windshields set at a special angle to reduce glare are further features. The driver's seat is separate and adjustable and has a foam-rubber top over coil springs. Air circulation is provided by wing-type window ventilators and controllable cab vents.

Inside door panels can be removed from the door and come out with the window mechanisms. There are aircraft-type map lights over each door.

For further information write to Mack Trucks, Inc., 350 Fifth Ave., New York 1, N. Y., or use the Request Card at page 18. Circle No. 374.

Wayne Crane News

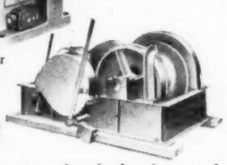
Robert Bushong has joined the Wayne Crane Division of American Steel Dredge Co., Inc., Fort Wayne, Ind., as chief engineer. This move is part of Wayne's expansion program.

"Superior" Electric

Carpullers

CAPSTAN TYPE, DRUM TYPE AND SPECIAL TYPES

Model SC Superior Capstan Carpuller



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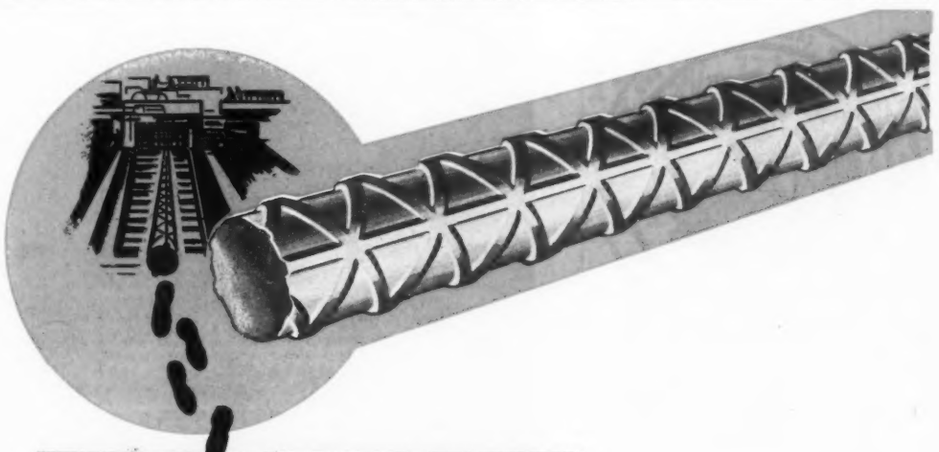
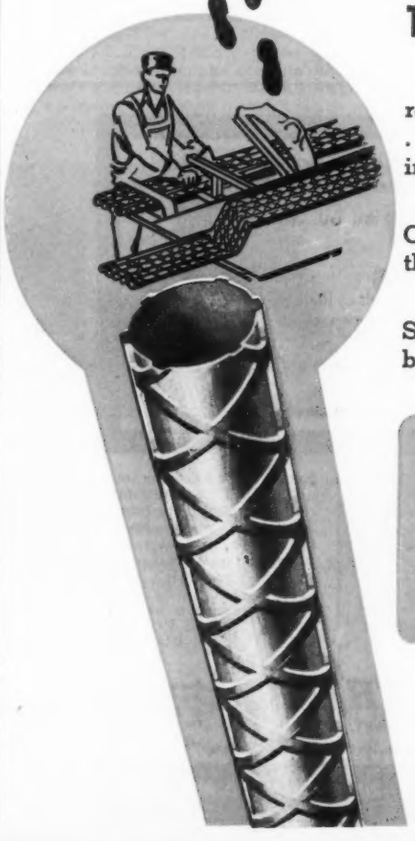


IT'S A MATTER OF FEET



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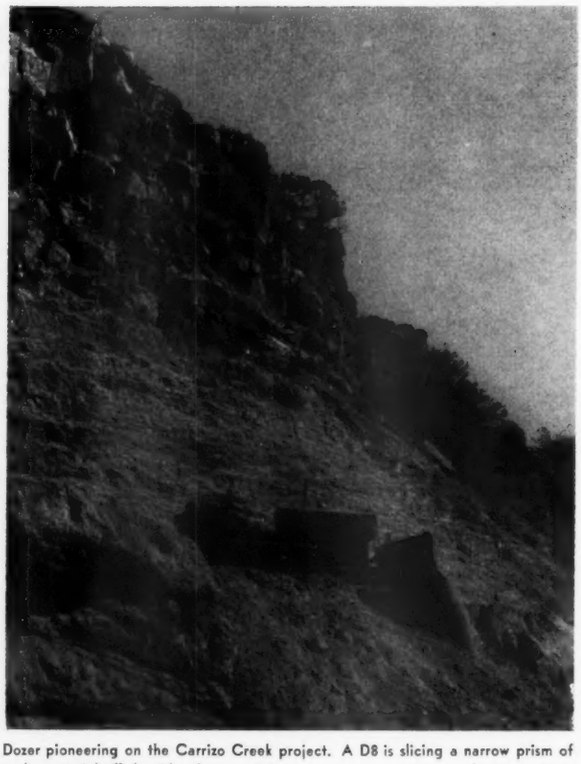
Carrizo Creek Hill Rebuilt in Arizona

• SIXTY-FIVE miles north of Globe, Ariz., where U. S. 60 used to twist and spiral its dizzy path up to Carrizo Creek Hill, the Arizona State Highway Department and Fisher Contracting Co., Phoenix, Ariz., have built a new road which flat-country road builders would never believe existed.

In 4.764 miles there are 363,500 cubic yards of excavation, 220,000 cubic yards in malapai and sandstone rock. A 146-foot cut looks directly down on a 206-foot 110,000-yard fill. Caterpillar tractors with U-dozers moved 30,000 cubic yards of that material, and the pioneer cat which started the cut worked for 2 weeks and 2 days before it got down to where it could get out of the cut. One catskinner put a machine to work on a slope so dizzy the diesel engine lost its oil pressure, and they had to bring it down from there fast.

The Carrizo Creek Hill has long been in need of improvement. In its 90-mile route from Showlow to Globe, U. S. 60 comes from high country down Carrizo Creek Grade to a long valley, and eventually goes on to drop down and off the precipitous walls of Salt River Canyon. The



Dozer pioneering on the Carrizo Creek project. A D8 is slicing a narrow prism of rocky material off the side of a mountain. *Ray Day Photo*

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"Tops" in Bucket Control

—Combination Tagline Winder & Dipper Trip

ADVANTAGES THAT MEAN "More Yards per Hour"

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2. Tagline pull remains uniform at truck level or 70 feet below machine.
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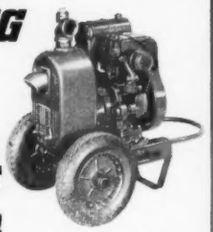

From 1½" to 10"
4000 GPH to 200,000 GPH

You can always depend on Sterling SRD* Self Priming Centrifugals. These rugged, heavy duty pumps are specially designed for dewatering on construction job —they NEVER CLOG, NEVER STOP as long as they have fuel! They pump continuously without attention all day, all night!

Sterling trash handling impeller is automatically self cleaning...recirculating priming action is automatic, never fails...suction check valve positively seals reprimed water in pump body...plus many more advantages that make these the MOST DEPENDABLE PUMPS MONEY CAN BUY!

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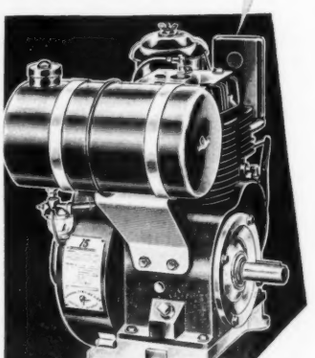

This rugged test definitely separates "the men from the boys". It demands stamina, dependability, and consistent powerful operation from an engine. Operating under a full load Gladden Engines successfully performed day after day without failure.

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scenery is some of the most spectacular in the West, including Grand Canyon. Due possibly to the scenery, or perhaps the loneliness of those 90 miles, Carrizo Creek Hill in late years gathered an ever-increasing number of white crosses which Arizona maintenance men put up to mark a death location.

Fisher Contracting Co. took the job for $595,900 in midsummer of 1952, under specifications which allowed until May 15, 1953, for completion. Fisher's contract called for grading, drainage, select material, aggregate base, and a bituminous surface. The job was originally let for a temporary bituminous penetration treatment, but at the time C&E visited the project, a change order calling for road-mix was being considered.

Job Has Climbing Lanes

Arizona has led the nation in the past 5 years in studies relating to truck performance on steep grades. As a result, the new Carrizo Creek Grade has widened sections where climbing trucks can stay in a special right-hand climbing lane, while faster automobile traffic rolls as usual. The new location has grades up to 6 per cent, but the alignment has been drastically improved. Long sweeping curves and tangent sections with good sight distance now replace the crooked curves on the old road still familiar to many U. S. 60 travelers.

The design called for a bituminous surface 34 feet wide over the entire job, with 33 feet added in the climbing lanes. Underneath the bituminous mat there is 3 inches of aggregate base-course material. Under that there is 9 inches of select materials on 3½ miles of the job; 12 inches through the rest. A short section of 4,600 feet is strengthened in addition by 6 inches of subgrade seal material.

Drainage features include corrugated-metal pipe up to 153-inch size. A double section of this type culvert carries one heavy wash through a high fill.

The Carrizo Creek Grade represents a battle by highway engineers to build a road in a vicinity where an igneous lava flow covers high flat country. In some distant geological era, the igneous cap eroded in a series of deep mountainous canyons, leaving a sheer hard escarpment which even the native deer and turkeys find hard to scale. Carizzo Creek runs through the bottom of one of the deep erosions.

(Continued on next page)

This view shows the enormous cut and fill on the Carrizo Creek Grade in its proper perspective. The TD-24 tractor and roller and other equipment are dwarfed by the size of the work under way. *Ray Day Photo*

Construction Buildings Bolted Together in a Few Hours!

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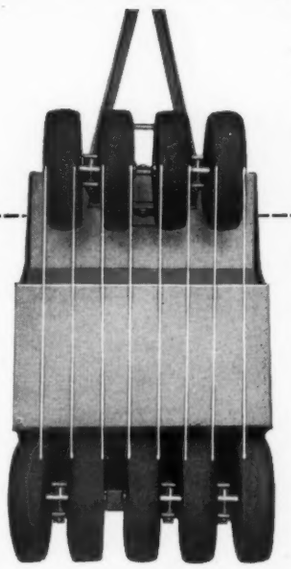
What's New in Compaction Equipment?



◀ NEW DEVELOPMENT BY BROS... EXTRA-WIDE TIRES NOW GIVE COMPLETE COVERAGE

Bros scoops the roller field! No more lines, ridges or marks when you work with new Bros Pneumatic Tire Rollers! New Bros wide-face tires give full compaction coverage in *one pass*. And you pay nothing extra — these new super-tires are now standard equipment on all three models, in both Straight-Wheel and Wobble-Wheel* designs. For any job from rough base compaction to seal coat rolling, you'll find a new Bros Roller does it faster and cheaper.

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Choose a 7, 9 or 13 ton maximum capacity model, and then vary working weights to suit your job. Bros Straight-Wheel design has wheels moving up and down on oscillating axles. Exclusive Wobble-Wheel* design adds a weaving, kneading motion to each wheel. Only Bros offers both.

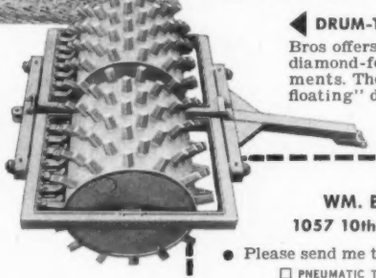
◀ GIANT "SUPER LOAD" ROLL-O-PACTORS*

These Bros "big boys" were featured recently in an *Engineering News-Record* article describing proved advances in compaction equipment. Roll-O-Pactors* have been more widely approved on the big jobs than any other compactor. 35 and 50-ton models available — working weights from 20,000 to 100,000 lbs. Rubber is the trend in compaction — and Bros is *first* in tried and true equipment.

*ROLL-O-PACTOR patents: U.S.: 2,610,557; Canada: 487,945; Mexico: 52,368

◀ DRUM-TYPE TAMPERS

Bros offers a complete line of sheepfoot and diamond-foot tampers for special requirements. They're really rugged! New "full-floating" design eliminates strains, permits individual drum oscillation and makes handling easier.



If compaction work is in your next job, it will pay you to find out what a difference Bros equipment can make in your time schedule and your profit figures. See your nearest distributor and mail the coupon for new literature.

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Carrizo Creek Grade Rebuilt in Arizona

(Continued from preceding page)

Traffic: Problem No. 1

Under such a setup, it was natural that traffic should be the first construction headache. The highway carries about 60 cars an hour during the daylight hours in winter and about 110 in summer. Somehow this traffic had to be accommodated through the construction area, because the nearest practical detour would have routed motorists via El Paso, Texas. Since the job contained so much blasting and excavation along sheer gorge walls with a drop-off often 500 feet or more, it was absolutely vital to handle this traffic safely without wasting too much construction time.

With the cooperation of the Arizona Highway Department and the Arizona Highway Patrol, a scheme was figured out which lost only 1 hour a day to traffic. The highway was posted at Globe and at Showlow, telling motorists they would be passed through the construction area on the following schedule:

From	To	Area
7:30 a.m.	9:30 a.m.	Closed to traffic
9:30 a.m.	10:00 a.m.	Traffic passes through
10:00 a.m.	12:00 noon	Closed to traffic
12:00 noon	12:30 p.m.	Traffic open, lunch time for crew
12:30 p.m.	2:30 p.m.	Closed to traffic
2:30 p.m.	3:00 p.m.	Traffic open
3:00 p.m.	5:00 p.m.	Closed to traffic

The job was open to traffic during the night hours after 5 p.m., and was also open 24 hours on Saturday and Sunday. Fisher set the project up on a 5-day 9-hour construction schedule, and with the good fortune of a relatively mild winter had the schedule shaded practically from the start.

In spite of the best possible approach, motorists generally failed to appreciate the delay at each end of the job, and protests to Phoenix were long, loud, and sometimes a little profane. Tempers cooled, though, when engineers patiently explained that roads like Carrizo Creek Grade take time to build.

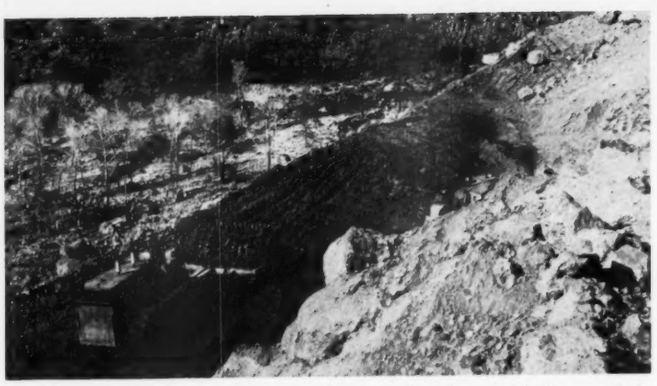
Rough Pioneering

Men like Page Thiers, project superintendent, and Paul Foster, his assistant, have built mountain highways in Arizona and other neighboring states for years, but they will tell you the Carrizo Creek Hill was the worst piece of pioneering they ever tackled.

"There just wasn't any place to start," Thiers explained. "You either had to start from the top of the escarpment where there wasn't room to work at all, or you had to move back of the cut stakes and do extra excavation. Sometimes we worked a berm up from the bottom, but it was always tricky business."

The steep rocky walls were covered with a sparse growth of brush and pine trees, so a small axe crew had some work to do knocking down this growth and burning it. Clearing, however, was no particular problem because the hill was too rocky to raise much of a stand of timber.

Cuts were pioneered at the start from the lower end of the job, leaving the spectacular 146-foot cut until later. Two Caterpillar D8's did practically all the pioneer work. They were equipped with Caterpillar power units and Caterpillar blades. One machine had a blade which could be angled and tilted simultaneously, and it proved invaluable in pioneering especially from the bottom up the sides of a cut.



The deepest fill was made in four berms, with dozers rolling the material off progressively to a spreading dozer below. This TD-24 and sheepsfoot roller are compacting fill material on a lower bench. *Ray Day Photo*

The most spectacular piece of pioneering was on the sheer 146-foot cut. Starting from the top of the escarpment, plans called for a thin sliver to be removed from malapai cap rock—and malapai is one of the west's hardest rocks—with the cut continuing down through a soft tertiary sandstone underlying the malapai flow.

Thiers started that one slightly back of the cut stakes, so he could work out a bench for his cat. It was a dizzy drop of about 150 feet straight down from that point if anybody made a miscue. You can look up the side of that rock face today to the point where the cat began its work, and it looks like the first landing under the floor of heaven. The D8 began to gouge its way down through malapai rock which had been drilled and exploded, working very slowly lest the rock ledge give way. After the machine dug itself down, it was 2 weeks and 2 days later before it could work its way out of the cut and around the side-hill. Fuel had to be brought in to the

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escarpment and run down to the machine through a long hose. The malapai was tough on the dozer blade and its cutting points but when welders came to repair the hard-facing, they had to scale their way down on safety ropes and rig extensions for their welding equipment. For that period of time the cat was lubricated entirely by hand guns.

Just as soon as a workable bench was established, other equipment helped out. In some of the medium formations particularly an International TD-24 with a Bucyrus-Erie dozer and ripper was invaluable for loosening the formation. When the hauling equipment could come in, the pioneering as such was done.

Possibly a rather spectacular exception to this statement was on the major cut, where 110,000 cubic yards came off to make a deep fill directly below. Approximately 30,000 cubic yards of that cut was handled to the fill by D8-mounted Caterpillar U-type dozer blades. The U-blades also were able to clean up the highway quickly a few minutes before traffic was due. The fill was so deep that it was built with four berms from the bottom, with tractors working on each berm to move material farther down.

Gardner-Denver 500-cfm compressor works away as the rocky point in the background is blasted.
Ray Day Photo

The principal complicating factors on pioneering were, of course, the ever-present problems of danger and traffic. The toe of the spoil pile under the pioneering cat always had to be in shape to be cleaned away in a few minutes to let cars through.

Two Equipment Spreads Grade

Separate equipment spreads were necessary to handle the different materials in the grading phase. Rock excavation called for air compressors, drills, power shovels, and trucks. The remaining softer material could be handled by tractor equipment, especially after it had been ripped.

The major part of the grade was in malapai and sandstone, both tough formations. Thiers started the rock work from the top of the escarpment at the north end of the job about the same time he started a scraper spread in softer material at the lower end of the work.

In the relatively flat plateau country at the top of the escarpment, where the new grade comes up through a deep cut, a Joy 6-inch rotary drill with Hughes bits was moved in to do about 15 per cent of the total amount of drilling. This machine sank holes 6 inches in diameter as deep as 43 feet. The holes were spaced on a 15 x 18-foot grid. Compressor equipment included two 500-cfm Gardner-Denver compressors, and Joy and Ingersoll-Rand 105-cfm machines completely self-sustained.

The rotary holes were loaded with 25-pound cartridges, 400 to 500 pounds per hole, of Hercules gelatin-type powder, 65 per cent strength, and these holes were then fired with Primacord detonating fuse. In general, good breakage was secured with the bigger diameter loading. The only disadvantage was the fact that so little of the project was flat enough for the big rig to set and work.

The main slug of drilling was handled by two Joy wagon drills and eight jackhammers. Ingersoll-Rand drill steel up to 40 feet long was used in wagon-drill work, and the smaller hand-held guns did shallower drilling. Ingersoll-Rand Carset bits were used as an answer to the malapai, and they did an excellent job according to Thiers. Few tungsten-carbide bits were sharpened, and many of these bits drilled as much as 500 feet in rock which ordinary rock bits would not cut at all. Wagon-drill holes were sunk on 8 to 10-foot centers, and bottomed at 2½-inch diameter.

Wagon-drill and jackhammer holes were loaded with Apache 40 per cent bag and gelatin powder, and equipped with Atlas Rockmaster delays to cut side slopes to neat lines even in malapai. The shots were fired by an ordinary blasting machine.

In practically all blasting, the traffic schedule prevented setting off anything but small charges of powder. Near the lower end, one 40-foot cut was loaded and loosened to the bottom at one shot, but it was in softer rock than malapai, where the whole job could be handled at once.

Rock loading was handled by two Northwest 80-D shovels with 2½-yard Esco dippers. Rock-hauling equipment from these machines included four 15-yard Euclid bottom-dumps and five 12-yard Euclid end-dumps.

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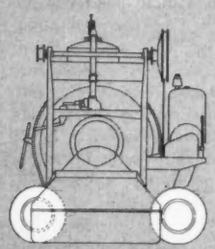
BIG enough for central mix plant jobs



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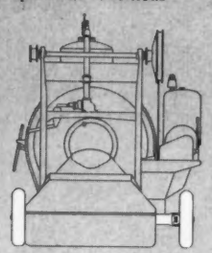
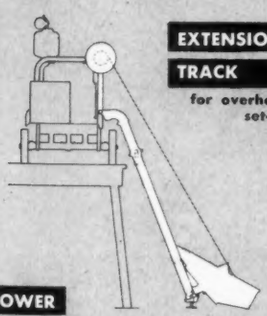
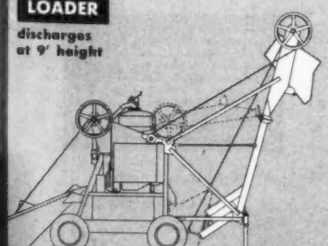
readily adapts mixer to suit operating conditions



EXTENSION TRACK
for overhead set-up



TOWER LOADER
discharges at 9' height



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THE PENGO EARTH AUGER

★ Twin helix—no back thrust!

★ Bores true, clean holes in any soil, most sandstones and hardpans, frozen ground, permafrost!

★ All wearing parts replaceable on job!

★ Made in 22 sizes, 9" to 72" hole diameters, to fit all makes of heavy-duty earth boring machines. Larger sizes on order.

THE PENGO CUTTING HEAD

★ Easy installation—welds to your present helix.

★ Bores where you never could before!

★ Wearing parts are replaceable on the job and are interchangeable with PENGO Auger parts. *(Described at left.)*

★ Made in 11 sizes, 8" to 24" diameters. Larger sizes on order.

THE PENGO WISDOM TOOTH

★ All PENGO Augers and Cutting Heads are equipped with the drive-on PENGO Wisdom Tooth, specially designed for use on earth augers; cast from special abrasion and shock-resistant steel alloy for *far* longer service life!

"Get the PENGO WISDOM TOOTH— It knows how to bore holes!"

★ SAVE HOURS . . . SAVE DOLLARS!

WITH

PENGO *Triple Flight* ANCHOR AUGERS

Especially designed to bore holes for EXPANDING ANCHORS

★ Double-helix cutting head eliminates back-thrust, quickly bores true and clean.

★ Triple-flight single helix carries bigger load of dirt from hole . . . you can complete a hole with less than half the trips down and up!

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Carrizo Creek Grade Rebuilt in Arizona

(Continued from preceding page)

In softer material applicable to tractor equipment, three scrapers were used. The fleet included a 20-yard Bucyrus-Erie 170-A, a 25-yard Bucyrus-Erie B-250, and a 20-yard LeTourneau Model W. International TD-24's with Bucyrus-Erie power units were used for towing and controlling this equipment, and a TD-24 and an Allis-Chalmers HD-20 served as pushers. The scraper haul for this fleet averaged about 500 feet.

In addition to these units, three 18-yard Euclid scrapers were used for longer hauls averaging 1,000 feet. These units were pulled by Euclid rubber-tire prime movers, and they covered areas specially suited to those units.

In spite of the mountainous terrain, fills were made with much more than usual care. Although specifications permitted 4-foot lifts to take care of oversize rocks, it was the rule rather than the exception to put the material down in thinner layers. A Caterpillar D8 with a dozer was available on fills to smooth the lifts, and compaction was handled by an International TD-24 and a huge 19-ton Southwest double-sheepsfoot unit. The roller was ballasted to a compactive pressure around 300 psi of tooth or foot surface.

Considerable water, too, was needed. A small sump was established along Carrizo Creek, and three Euclid tankers were brought in. The biggest unit, a 4,200-gallon affair, stayed until all the dirt work was in. Other units included a 3,600 and 3,200 gallon tanker. All water equipment included Rex pumps and Hercules gasoline engines which picked up the water out of the creek and, under pressure, sprayed it over the fills.

Rock cuts were finished off with slopes varying from ½ to 1 down to ¼ to 1. Fill slopes were more carefully controlled and were generally held even to the 1¼ to 1 slope on the plans.

Good Equipment Upkeep Plan

Nothing could be harder on equipment than the usage which Fisher's machines took. Battered and beaten through the toughest kind of rock in Arizona and run through snow and mud and dust at an elevation over a mile high, every unit took real punishment.

Field maintenance was provided, however, not only by the mobile service truck and grease men, but by a crew of four full-time mechanics under Chris Hulls, equipment superintendent, and E. J. Fowler, master mechanic. A yard and shop were established close to both ends of the job, and critical parts were stocked there. In addition, Fisher's main office and yard in Phoenix were only 150 miles away, and those headquarter facilities were backed up by Phoenix distributors for the equipment. State Tractor & Equipment Co., for example, has one of the finest International and Euclid parts inventories in the Southwest.

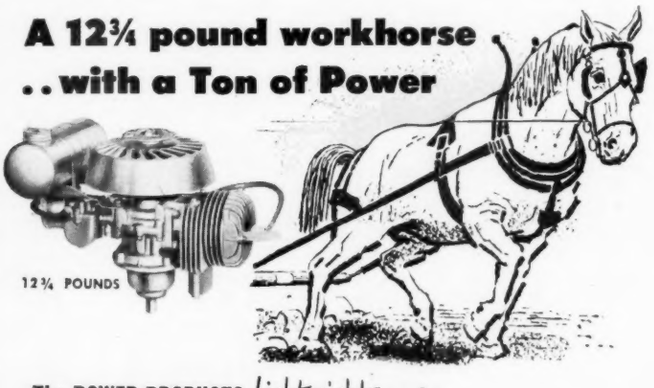
After as rugged an operating assignment as these machines drew, one might believe that operation was exceptionally rough. Such was not the case. Job conditions were tough enough without adding to the punishment by reckless operation, so "cowboying" was not tolerated. Visiting the job, you seldom saw one of the TD-24's, for example, running faster than third gear. The cats high up on top were doing a lot of pioneer work, but their operators were seeing to it that it was done without harming the units.

Richfield Circle C lubricating oil was used on a 100-hour change basis.

Two Crusher Setups

The aggregate-base material and most of the select granular topping came from two gravel pits. Thiers expected to move a Cedarapids Junior Tandem plant in to crush this material, and to turn out whatever mineral filler was required in

A 12¾ pound workhorse . . with a Ton of Power



The POWER PRODUCTS *Lightweight* packs more power per pound

When it comes to lightweight power nothing can touch this engine. Not only is it amazingly lightweight, but it has every important quality feature to assure long, dependable performance

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- FULL CARBURETION
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For portable equipment, you can't find a better engine for lightweight and dependability.

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GRAFTON, WISCONSIN

the road-mix or penetration treatment, whichever was decided upon. At some time in the future a contract for asphaltic concrete will round out work under this contract. Fisher's contract is the third piece of work done on the Showlow-Globe route in the past three years. A fourth section was opened to bidders in mid-February. Although the fourth section is in lower country and is not as difficult as Carrizo Creek Grade, Fisher did not bid and the lowest bidder was 13 per cent over the engineer's estimate. Contractors have a healthy respect for this type of road building.

Even with completion of the next section, however, the Showlow-Globe route will still be one requiring careful driving. Carrizo Hill, Salt River Canyon, and the beautiful tree-covered high country around Showlow exemplify Arizona at its best, and even a careful driver may still straighten out one of those curves while looking at this unbelievable scenery.

Personnel

The Arizona Highway Department is under the supervision of R. C. Perkins, state highway engineer, and field supervision was under C. B. Potts, resident engineer.

Truck Mixer Line Shown

A line of inclined-axis truck mixers is described in a new catalog from the Worthington Corp., Construction Equipment Division, Plainfield, N. J. Models LC and LO of the Hi-Up truck mixer line are described in detail. Photographs and text cover each component of the mixer. This includes frame transmission, clutch, brake, drum rollers, drive and head, water system, drum and blading, hopper, chutes, and doors and inspection plates.

The mixers are made in 3, 4½ and 5½-yard models.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 469.

Literature on Excavators

A line of excavators is shown in literature from the Clark Equipment Co., Construction Machinery Division, Miller & 2nd Sts., Benton Harbor, Mich. The Michigan line includes the Model T6K, a small, 7½-ton, maneuverable, truck-type excavator-crane with a 130-inch wheelbase and 11.00 x 20 tires. The chassis engine supplies power for traveling and for the turntable mechanism. A similar unit, the Model S-4, has 4-wheel drive and big 12.00 x 20 tires. Wheelbase is 150 inches.

A 2-engine version of this unit is the ½-cubic-yard Model T-4. A separate turntable engine gives the operator the control of engine speeds necessary for precision crane work.

The Model TMDT-16 is a heavy-duty 12½-ton unit mounted on a tandem drive Michigan truck chassis. It converts to all standard front-end attachments.

The heavier Model TLDT-20 has 2½ tons more lifting capacity. This machine is primarily for hoisting, clamshell, and dragline work.

A crawler-mounted ½-cubic-yard 6-ton unit, the Model C-16, has the same basic air-controlled turntable mechanism that is used on the ½-yard truck excavators.

The literature lists complete performance specifications for the excavators used with crane, shovel, and hoe.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 460.

Dodson Is Vice President

Howard W. Dodson has been appointed vice president of Lessmann Mfg. Co., Des Moines, Iowa, which was recently purchased by United Steel Barrel Co., Philadelphia, Pa.

Since 1937, Mr. Dodson has also been vice president in charge of production of United Steel Barrel Co.

Engineering changes are expected on the Power Crowder-Arm loader, a heavy-duty loader manufactured by the company.

HERE'S A FASTER, EASIER, CHEAPER WAY TO HANDLE MORE DIRT, ROCK OR GRAVEL!

OMAHA STANDARD TRAILERS

The OMAHA STANDARD "CENTER DUMP" Trailer . . .

. . . Custom Built to Job Requirements is designed for contractors who want to haul dirt, gravel, rock, long or short distances, quickly and at low cost, for stock piling, spreading or dumping. Contractors say it is just what they have been looking for!

★ Each unit built to job requirements.
★ Available in sizes and lengths to meet all bridge and axle laws.
★ All *steel welded* body, chassis. Built to withstand roughest loading, toughest service.
★ Dumping mechanism FOOL-proof—trouble-FREE!
★ Release on doors INSTANT, SHOCK-PROOF, protected from material flow.
★ DOOR OPENING Meter control that can be *pre-set*.

Write at once for specifications and descriptive folder that will answer your questions and show how you can make every load a "profit" load. Address today Dept. A

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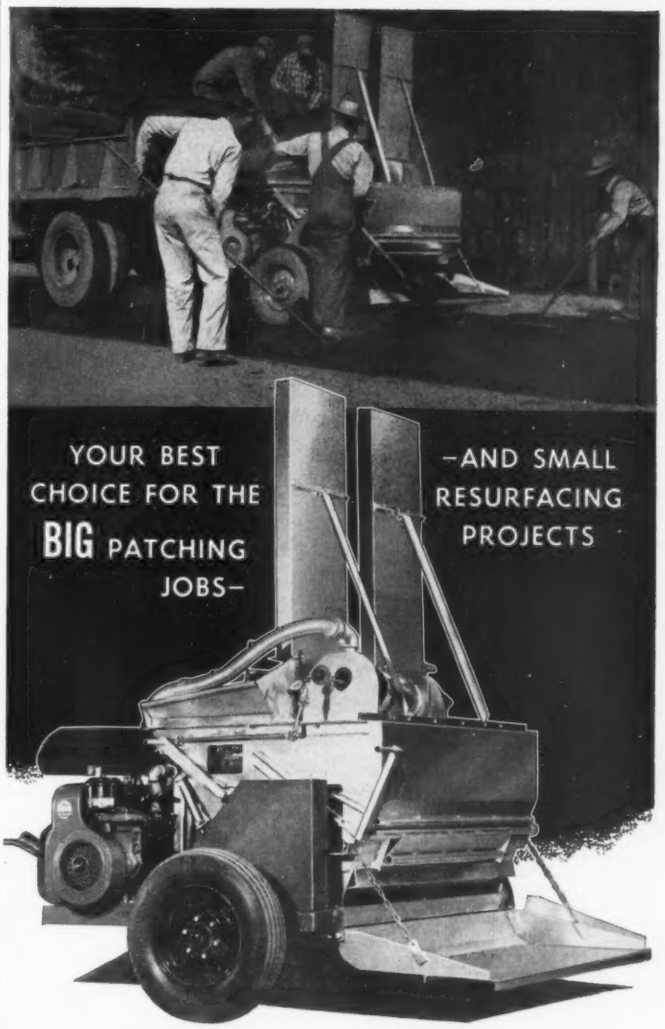

NEW McConnaughay MODEL HTD-LP MULTI-PUG ASPHALT MIXER (6 Cu. Ft. Capacity)

In any season . . . under wet or dry conditions . . . this new McConnaughay HTD-LP Mixer can assure you the fastest, most economical production of bituminous paving mixtures (hot or cold) for big patching jobs, small resurfacing projects, driveways and parking areas. Working right on location, it provides the exact amount of paving material needed . . . never too much or too little. With mixer and heating unit combined, it will reactivate and heat up to 20 tons of stock pile mixture per hour, prepare up to 8 tons of hot or 18 tons of cold asphaltic mixtures per hour, dry various types of wet aggregates quickly, remove both moisture and solvents from bituminous mixtures. Other features include low pressure burner, blower for fuel atomization, stacks for removal of gases, 6 cubic foot mixer capacity. Write, wire or 'phone for details and specifications.

K. E. McCONNAUGHAY
LAFAYETTE 2, INDIANA

"ON-TIME" Maintenance *cuts* "DOWN-TIME" REPAIRS!

HOBBS Engine Hour METERS

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You get longer life and longer periods of trouble-free operation when you know the length of TIME your powered equipment has run. A revolution counter can't tell you — it takes a true timing instrument that records HOURS and MINUTES. The HOBBS ENGINE HOUR METER is such an instrument . . . it helps prevent breakdowns and prolong equipment life.

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Installed as original equipment and/or recommended by leading manufacturers. Get full information from your factory branch, representative or distributor . . . or write for FREE CATALOG 569.

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Booklet on Aluminum

A new 186-page booklet will tell anyone already familiar with welding of the older metals what he needs to know about welding, brazing, and soldering aluminum. A discussion of aluminum alloys explains the factors that give these alloys their particular welding characteristics.

Strong emphasis is placed on the newly developed processes such as inert-gas-shielded metal arc, and the multi-arc. A section in the manual presents recommended materials and procedures to be used with aluminum-coated steel.

This manual will be sent without charge to any engineer, technical man, or company executive requesting it on company letterhead. To others the price is $1.00 per copy. Write Department PR, Reynolds Metals Co., 2500 S. 3rd St., Louisville 1, Ky.

Interior of a recent version of the Stran-Steel long span buildings.

Clear-Span Buildings Are Prefabricated

Prefabricated clear-span steel buildings are now available with unobstructed interior widths of 50 and 60 feet from the Stran-Steel Division of the Great Lakes Steel Corp., Detroit, Mich. The structures are made of framing, roof trusses, and corrugated steel sheeting. Designated the long spans 50 and 60, the new structures are available in a basic-unit length of 48 feet to which any number of 16-foot extensions may be added. Units may be joined side by side for extended widths. The 50 and 60-foot-wide roof spans are achieved by bow-string trusses designed for field assembly. The trusses are supported by columns on 16-foot centers. Interior height under trusses may be either 15 or 20 feet.

Each building is available in two models, one meeting requirements for 20 and the other for 30-pound live loads.

The new-sized long spans are introduced to meet the need for clear-span buildings in which column-spacing requirements along the depth do not demand the 40-foot clearance available in earlier structures made by the company.

For further information write to the company, or use the Request Card at page 18. Circle No. 452.

Builder in Turkey

A resort spa on a mile-long stretch of sandy beach on the Aegean Sea will soon be built by the Thompson-Starrett Co., New York, N. Y., with the aid of Turkish private capital and the use of local labor and materials.

The resort, which will include 1,500 modern 1 and 2-story homes, a hotel, swimming pools, tennis courts, schools, a hospital, and utilities, will be located at Cesme, 80 miles from Izmir (Smyrna). Natural hot sulphur springs in the neighborhood will be utilized as part of the community's health-building program. Cost of the resort as presently planned is put at about $15 000,000. The first phase of the construction began in June and will see completion of the first 400 houses within ten months. The entire community, including roadways, is scheduled to be finished within three years.

Thompson-Starrett also designed and fabricated construction equipment and furnished consulting engineering service in construction of the Sariyar Dam, part of the large-scale hydroelectric development plan for the Sakaria River in central Turkey.

Lamar Co. Acquired by American-Marietta

The entire interests of Lamar Pipe & Tile Co. have been acquired by American-Marietta Co., 101 E. Ontario St., Chicago 11, Ill. With manufacturing plants located in Grand Rapids, Saginaw, and Jackson, Mich., the company will be operated as the Lamar Division of American-Marietta Co.

Principal Lamar products include reinforced-concrete sewer pipe, precast manhole structures, culverts, concrete bridge sections, drain tile, and Tunneliner pipe. American-Marietta's present brick and tile manufacturing plants are being surveyed to determine best locations for future expansion. Other American-Marietta plant sites throughout the United States and Canada are being considered as possible production points for Lamar products.

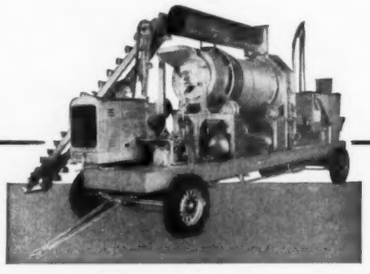
"IT'S THE GREASE FOR TOUGH OPERATIONS"

says McCULLOCH MOTORS CORP.
Makers of the famous McCulloch Chain Saws

"We tested all types and makes of lubricants for the Zerol gears in the transmission. The one grease selected for long, tough operation was LUBRIPLATE. Now that we have produced thousands of McCulloch Chain Saws, we more than ever recommend the use of LUBRIPLATE Lubricants in our tools."

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.



Portable Asphalt Plants For City, State, Repairs and Small Contract Work

These 8-10 tons per hour Asphalt Plants economically repair almost any pavement. Asphalt, brick, concrete, macadam, can be resurfaced or patched. Alleys, driveways, sidewalks, industrial plants can be paved.
Produce for immediate hot laying, or for deferred cold patching. Match any bituminous surface.
Mixes at plant, including labor, fuel, and overhead, cost about $4 per ton, with $2 aggregate. Average 160 to 200 sq. yds. 1" thick per hour. A money-maker for small contract work. Also larger plants, 15 and 30 tons per hour.

Write for catalog and name of nearest dealer.

Elkhart 9 White Mfg. Co. **Indiana**

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IS THE REASON
COMPLETE
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DE-WATERING JOB

It's the simple formula that explains why Complete Wellpoint Systems de-water successfully when other methods fail. "D" means diameter of the wellpoint. "4D" means that you get 8" drainage on 2" diameter—when the wellpoint is "COMPLETE".

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WELLPOINT
SYSTEMS
FOR SALE OR RENT

The Tilden water-feed Konkrete Kore drill has a new water-feed assembly.

Water-Feed Attachment For Concrete Drill

A water-feed attachment for the Tilden rotary Koncrete Kore drills is the newest development of the Tilden Tool Mfg. Co., 209 Los Molinos, San Clemente, Calif. It is made for use with concrete drills of 1½ to 8 inches in diameter.

Water flowing through the drill's core cavity removes cuttings and debris and, at the same time, lubricates and cools the drill. The water-feed assembly includes a convenient shut-off valve for the driller to control water flow. The water attachment fits standard garden hose connections.

The drills can be used in ordinary electric and air-drill motors with ¾-inch chuck size or larger, and with number 3, 4, and 5 Morse tapers.

For further information write to the company, or use the Request Card at page 18. Circle No. 350.

Round-Column Molds

Adjustable metal forms for round-column concrete construction are shown in literature from Deslauriers Round Column Mould Co., Inc., 2903 Central St., Evanston, Ill. The molds are made of galvanized steel and will not stretch, warp, or break from moisture. They are butt-jointed at the vertical and horizontal seams.

Special sections of the mold include a continuous bell-shaped capital and another that makes a 135-degree angle where the column joins the capital.

The booklet suggests that it is more economical to rent the company's molds than to buy column molds outright.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 411.

Chain Saw Announced

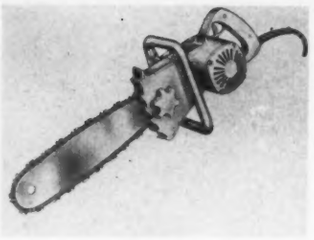
An electric chain saw has been announced by Skil Corp., 5022 Elston Ave., Chicago 30, Ill. The new Model 125 cuts heavy lumber and timber up to 14 inches on one cut.

A push-button oiler on the saw lubricates the chain while it is in operation. The clipper-type plated chain travels at 1,400 fpm.

The saw weighs 16½ pounds and has a motor said not to stall on rough cuts. Spade-type rear handle and wrap-around universal handle make for easier handling. Other features include lightweight aluminum-alloy housing, ball and needle bearings, safety trigger switch, and steel helical gears.

Standard voltage is 115, but the tool is available on special order for 220 volts. The saw runs off a 1,500-watt generator.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 377.



Boston Center Project

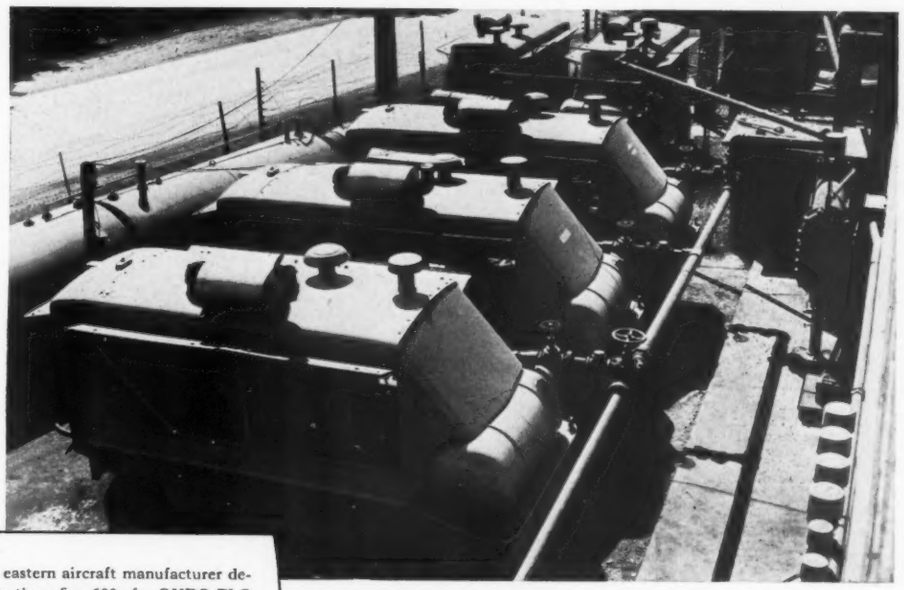
A $75,000,000 center project on the 28-acre site of the Boston and Albany Railroad yards in the Boston, Mass., Back Bay area, will be built under Stone & Webster Engineering Corp., consulting engineers and construction managers.

The newly organized Stevens Development Co., which purchased the Boston railroad yard property last February, is handling the development of the project, and is headed by Roger L. Stevens as president and Jansen Noyes, Jr., as vice president and treasurer. Architects for the project will be known as the Boston Center Architects. Included in the group are Pietro Belluschi, Walter Gropius and his associates known as The Architects Collaborative, Walter F. Bogner, Carl Koch and Associates, and Hugh Stubbins, Jr.

The project, which will be built on an area twice the size of the Rockefeller Center area, New York, N. Y., is expected to include more than 1,000,000 square feet of office space and 850,000 square feet of store space. It is expected that in conjunction with the project, a hotel of 750 rooms and a convention hall will be constructed.

3000 cubic feet of air per minute

20 HOURS A DAY — 6 DAYS A WEEK!



A large eastern aircraft manufacturer depends on these five 600-cfm GYRO-FLO portables to provide a continuous supply of compressed air for testing purposes, while permanent facilities are being constructed. Pressure is automatically maintained within 100 and 110 psi throughout the entire capacity range of compressors.

...with these five

GYRO-FLO ROTARY PORTABLES

Taking over a job, later to be handled by I-R *stationary* units, these five *portable* compressors supplied 3,000 cfm of clean dry compressed air on a nearly continuous schedule. Their performance under these grueling conditions has been completely satisfactory.

Such service-proved dependability of GYRO-FLO compressors has made them the most wanted compressors in the world today. This dependability is the result of GYRO-FLO's advanced rotary design—with only one fifth as many wearing parts as old style piston-type compressors. There are no valves to leak—nor are there pistons, rings, rods or clutch to wear out, replace, adjust or maintain.

Oil injection cooling gives discharge air that's at least 100° cooler than in other types of compressors, greatly increasing the life of air hose. Oil injected for cooling also flood-lubricates all moving parts of the compressor. A separator removes every trace of this oil from the air before it enters the hose.

The continuous rotary action produces a steady flow of compressed air—free from pulsations or vibration.

If you want the world's most *modern* portable compressor, write, wire or phone your nearest I-R distributor or branch office.

IR CONTRACTORS' COMBINATION 886-2

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A Hayward Bucket keeps the job going ahead on scheduled time. It won't quit or cause time out.

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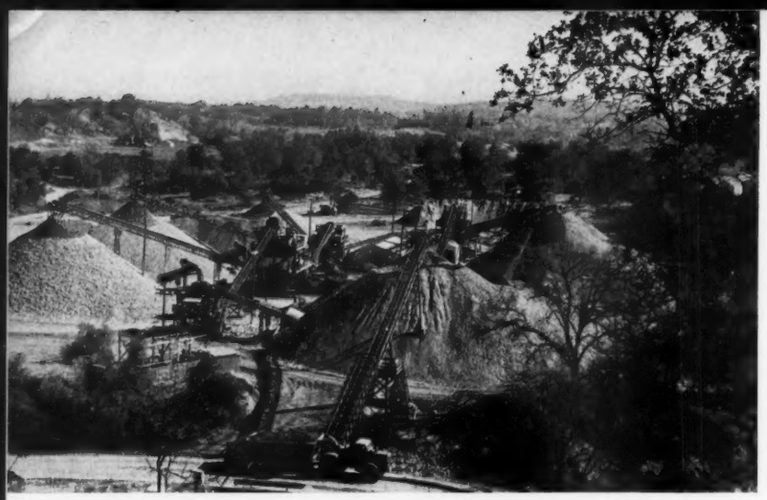
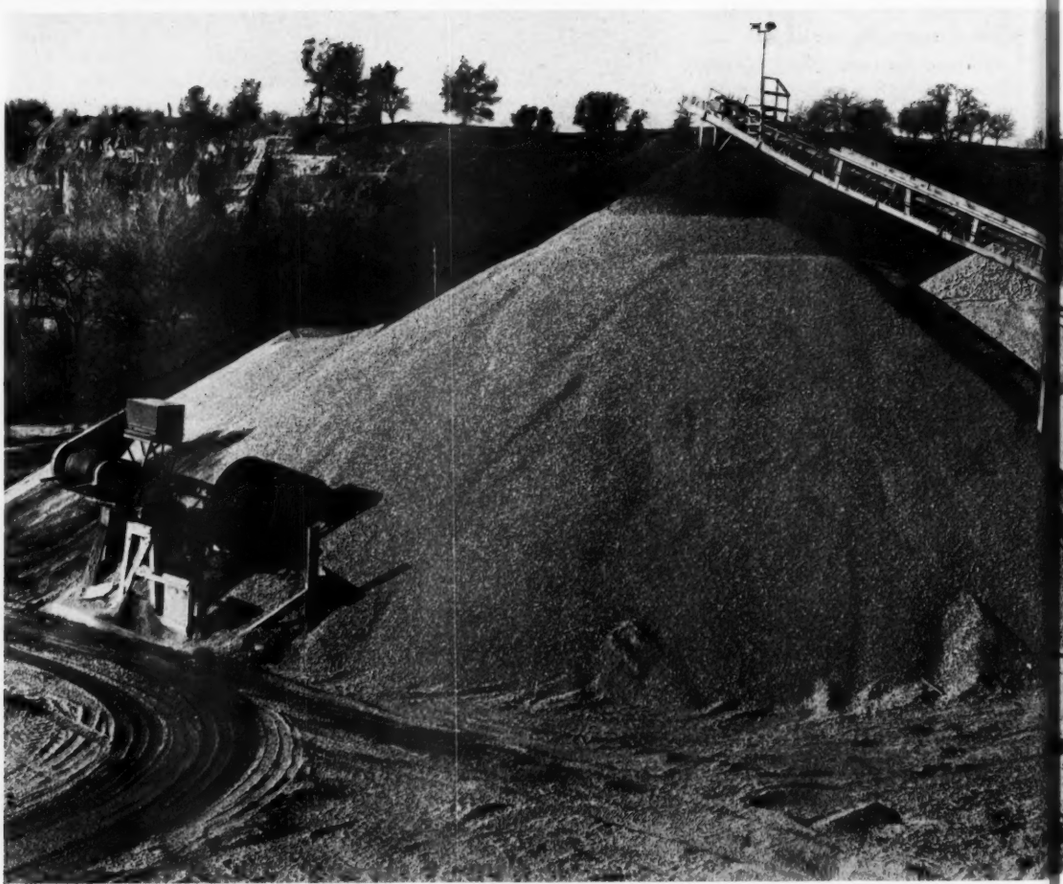
Hayward Buckets

Folsom Dam

Aggregate Production and Handling; Making and Placing 50-Degree Concrete

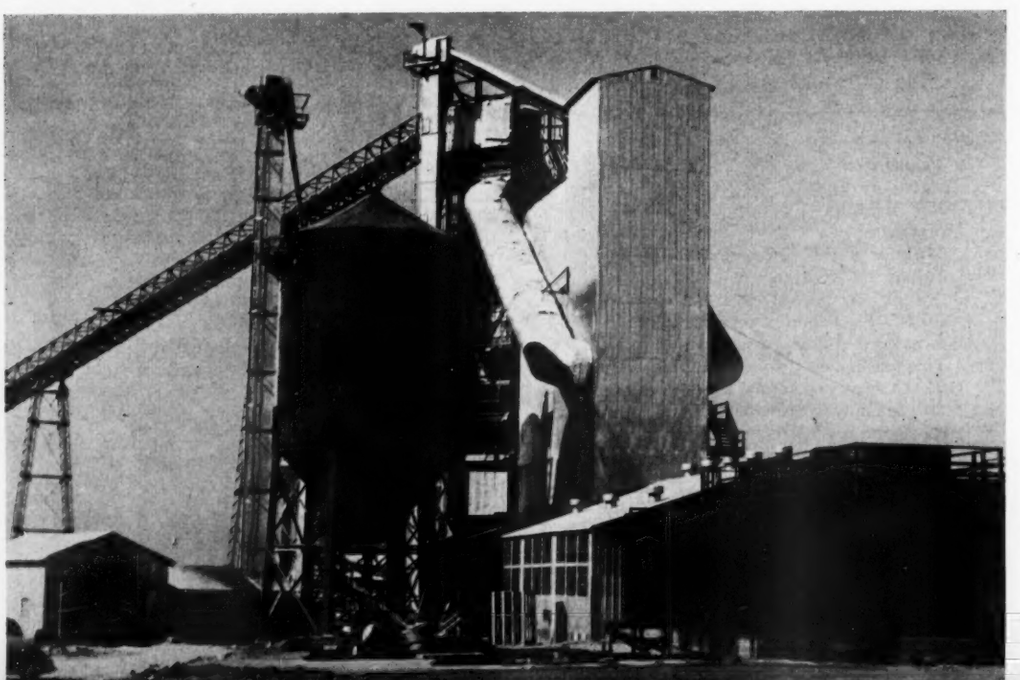


An over-all view of the rock plant. A Euclid is dumping over the plant hopper. Material is classified in the heart of the plant.



A detailed view of the aggregate production plant. Here the material is washed and screened; oversized rock is also removed. Barber-Greene conveyors feed the huge surge piles.

This large cooling plant for hot-weather concrete work was set up in conjunction with the batch and mixing plant.



• CORPS of Engineers technicians are trying to produce a 1953 model concrete—the kind that's supposed to last a thousand years—for the main portion of Folsom Dam. Folsom, a combined flood-control and hydroelectric project, is under construction jointly by the Corps of Engineers, U. S. Army, and the U. S. Bureau of Reclamation on the American River, 20 miles east of Sacramento, Calif. Merritt-Chapman & Scott Corp., New York, N. Y., and Savin Construction Corp., Hartford, Conn., have the $30,000,000 joint-venture contract.

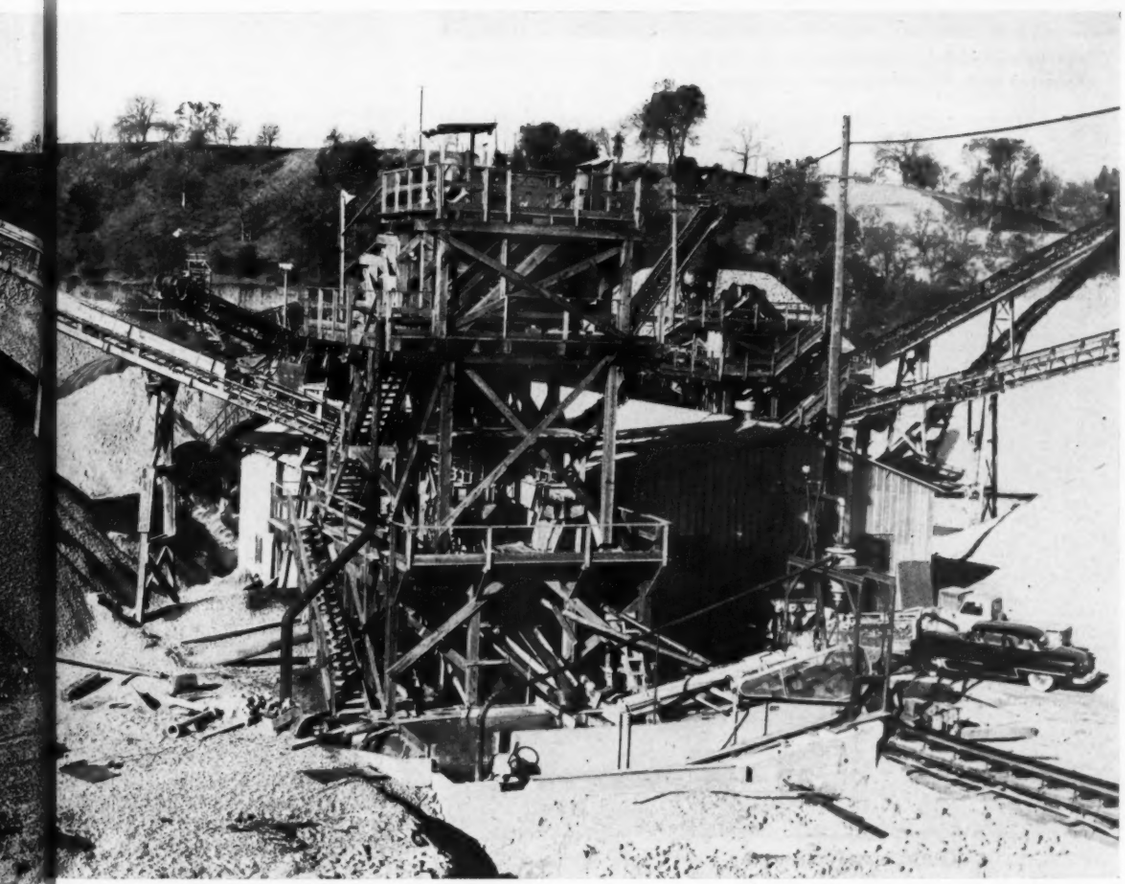
The U. S. Bureau of Reclamation's participation is limited to the construction of the powerhouse, which is now under way under a contract with Guy F. Atkinson Co., South San Francisco, Calif., apart from the Savin operations. The USBR will also operate the dam after its completion.

The concrete phase employs vari-

Checkrein on the American River

By RAY DAY

A special conveyor bridge carries aggregate across the river. The line continues on to the concrete-mixing plant, left background.



ous aspects of modern masonry technology, including the use of a natural stream-bed deposit of raw material, a rather unique method of transporting this material across the river, the world's largest cooling plant of its type, modern batching facilities, and traditional placing methods.

It is a study in contrasts. The 800-foot conveyor suspension bridge which Consolidated Western Steel Corp., Houston, Texas, built to move the aggregate from one side of the river to the other was constructed especially for this job. The concrete-placing trestle and crane equipment, on the other hand, is the same setup which veteran dam builder Harvey Slocum first used at Friant Dam, California, and which later on moved to Dale Hollow Dam, Tennessee, and Bull Shoals Dam, Arkansas, for their construction.

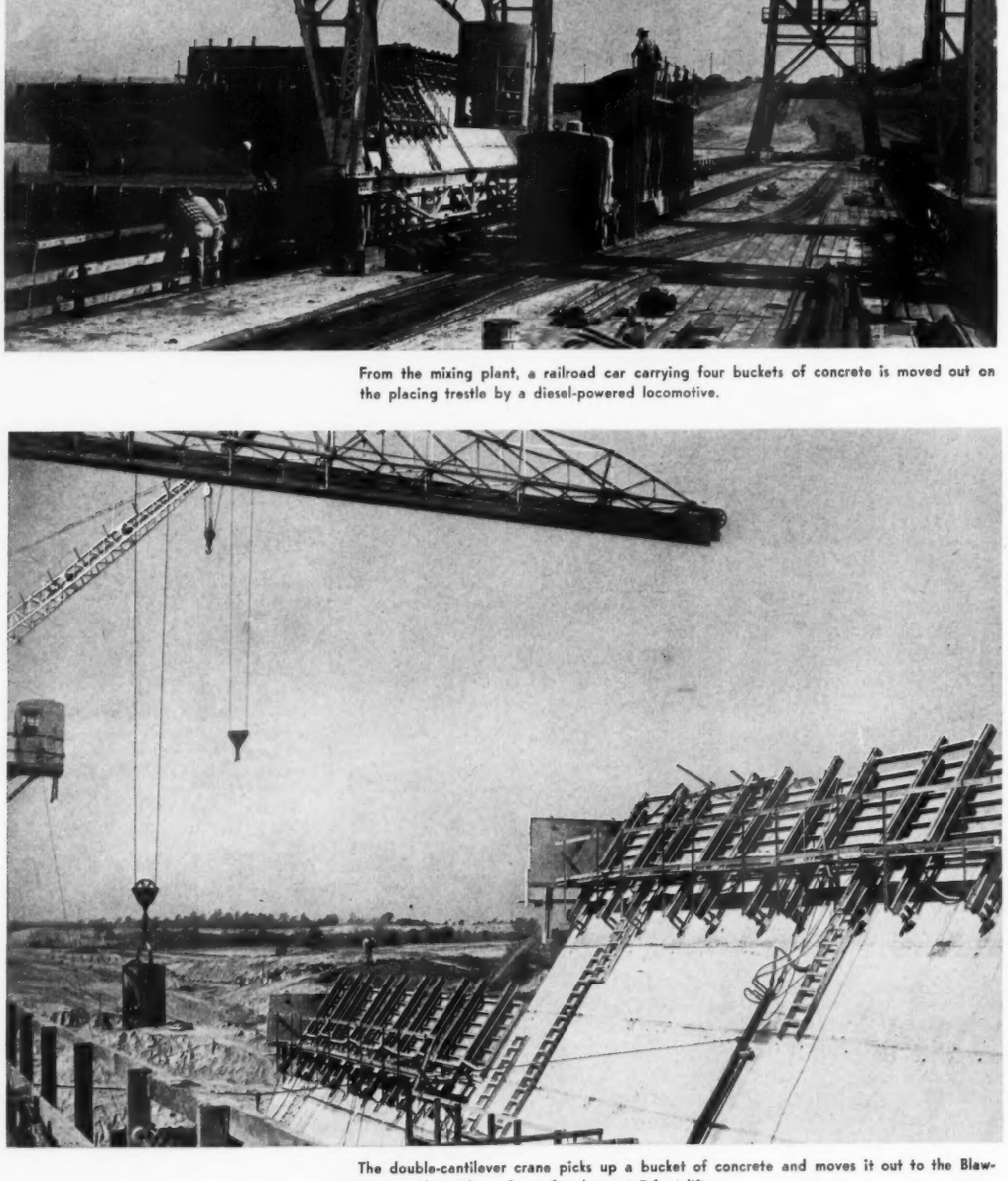
Folsom Dam, in fact, represents a combination of the concrete know-how used by the Corps of Engineers for its construction of Pine Flat Dam, east of Fresno, Calif., and the physical supply characteristics at Bull Shoals. Folsom's aggregates are located below the dam on the right bank of the stream, as they were at Bull Shoals. The Bull Shoals plan placed the powerhouse and switchyard areas on the opposite bank of the river, so that Slocum could set up his batching and cooling facilities on the right bank, thereby hauling the concrete materials across the river but once.

At Folsom, however, where a USBR powerhouse and switchyard contract has this important area tied up, it is necessary to move the material across the river to an available cooling and batching area at the top of the hill on the left abutment, and then return much of this material back across the river as it is placed in the dam.

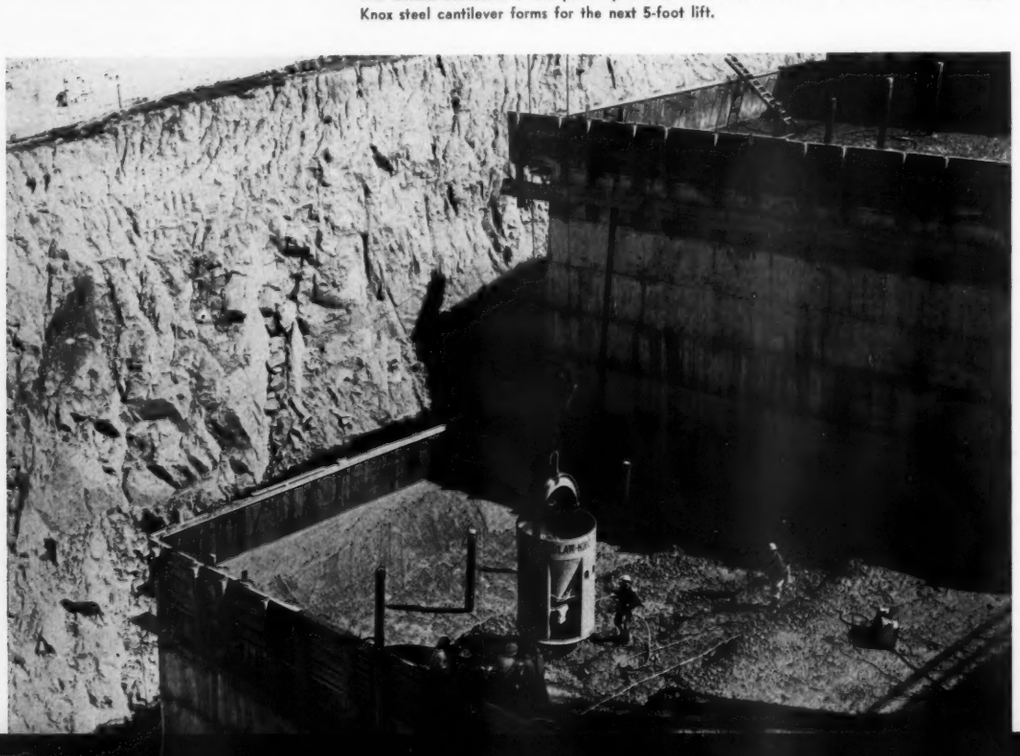
(Continued on next page)

Inside the Johnson automatic batch-plant. Operator R. N. Fowler works the control board.

From the mixing plant, a railroad car carrying four buckets of concrete is moved out on the placing trestle by a diesel-powered locomotive.



The double-cantilever crane picks up a bucket of concrete and moves it out to the Blaw-Knox steel cantilever forms for the next 5-foot lift.



Four yards of concrete are discharged from this Blaw-Knox bucket. Note "stairstep" placement method.

Folsom Dam: Checkrein On the American River

(Continued from preceding page)

Production Job First

The first phase of Folsom's concrete consists of a production job represented by the excavation of stream-bed material from a pit about 3½ miles below the Folsom dam site, and of producing the finished aggregates. The sand and aggregate site is located on Mississippi Bar in the American River, where for many years the stream has deposited untold thousands of cubic yards of well washed material ranging from boulders down to sand. There is more than enough of this material to build Folsom's 1,100,000-cubic-yard mass.

The only deficiency exists in material at both extremes of the scale. There are not enough 6-inch cobbles, for example, and this material is being rounded out by hauling auxiliary cobbles from farther downstream, where gold dredge-tailings piles have been built up over the years. The Mississippi Bar deposit is also deficient in No. 200 mesh fines, so the rock-production setup must make use of a rod mill for the production of the missing fines.

The tailings location, combined with the bar deposit, is furnishing the total amount of material. The tailings-pile material is being handled by a Northwest 80-D, using a 2½-yard Esco dipper, and loading to three Heiliner 800's. These machines bring the material to a common feeder trap at the input point at the rock plant. The main Mississippi Bar excavation removes a native stream-bed material, often from below water surface, and in order to drain this material properly, a Manitowoc 5-yard dragline with a 120-foot boom first digs the gravel and stacks it in a 20-foot stockpile.

After this stockpile of material has drained perhaps 24 hours, it is loaded by a Northwest 80-D shovel to a fleet of Euclid bottom-dumps, usually consisting of 3 units. Both 13.6 and 25-yard machines are being used. The feeder trap is a reinforced-concrete affair, with drive-over provisions, where the belly-dump machines can discharge their loads by gravity through grizzly bars. The number of oversize rocks retained at this point is negligible, and most of the material drops on through to the 3-load hopper above the feeder.

Two Telsmith plate feeders, 4 x 7 feet and 3 x 6 feet, driven by 20 and 10-hp gear head motors. place the material on a 36-inch, 257-foot conveyor belt. This conveyor, like all others in the plant, is a Barber-Greene, and is driven by a 125-hp gear head motor. The stacker conveyor places the material on a surge pile, which in turn feeds to a scalping screen by way of a 4 x 7 Telsmith plate feeder. This scalping screen takes away all cobbles greater than 9 inches in size. Material passing

the screen goes to a central classification tower, while oversize material retained passes directly into a 13-B Telsmith gyratory crusher, arranged in closed circuit with the elevating conveyor.

At the classification tower, sand is removed by a Telsmith 5 x 12 set of two screens. The sand is then brought out and put into Telsmith and Wemco dewatering screws, where it is stacked to a surge pile. All sand from ⅜-inch-minus is sent to this surge pile. Originally an attempt was made to separate the sand dry at this point, but the scheme was not successful. The installation of dewatering screws speeded the operation and made it considerably more certain than it was before.

Retained material at this classification tower is shunted into a Telsmith Hercules trommel, where it is washed and the first of some sizing work is done. The 6 to 3-inch cobbles (actually most of the 9-inch cobbles are being used) are taken out at this trommel, and dumped to a 60,000-ton surge pile by means of a conveyor. The 3 to ¾-inch size goes to two 4 x 10 Telsmith Vibro-King screens, divided three ways. These screens classify the material further. Three to 1½-inch aggregate goes to one surge pile over a conveyor; 1½ to ¾-inch goes to another surge pile; while the ¾-minus passes by means of a conveyor over to a main stacker conveyor, which also carries some fine material left over from the sand operation.

Considerable additional work is necessary to convert the sand surge pile to a finished product. Sand from the surge pile passes to a main sand plant, where it goes to two 4 x 12 Telsmith Vibro-King screens, with a ¼-inch top scalping deck. Particles retained on this scalping deck are used partly as rod mill feed, while excess of this size passes out to the ¾-minus storage pile. Materials which pass these screens go to a pair of Dorr sizers, which eliminate the excesses, and make the first step of a final blend. About 40 per cent of the material is used in this manner. The other portion passes to a Dorr classifier, along with the product from the Dorr sizers. A Marcy rod mill in the system discharges also to the Dorr classifier.

The final sand blend is then made in this classifier from material entering from these several locations. The finished sand blend is sent out over a conveyor to a semicircular stockpile, built with a swiveled conveyor connection and a circular track. Sand is loaded to Mack trucks by a 4-yard Tractomotive shovel mounted on an Allis-Chalmers HD-20 tractor. Trucks hauling this material make a 2-mile trip and dump in the sand compartment of a surge bin on the right bank of the river below the dam.

Over-all shot of the layout on the left bank of the river above the dam. Contractor's administration building is at the left. The long conveyor ends at the cooling, batching, and mixing plant. Cranes on the placing trestle are at the right.

The other aggregate piles are tapped by 10-foot diameter Armco tunnels. On the large-size cobbles, a Telsmith plate feeder brings the material out to a loading conveyor, where the trucks can take it on. The truck drivers control loading. On the other sizes of material, Syntron vibrating feeders, which deliver a dependable flow, are used. The fleet of 10 Macks assist in hauling this material to a 5-compartment receiving bin just below Folsom Dam.

Rock-plant components have been very well standardized. All screen-

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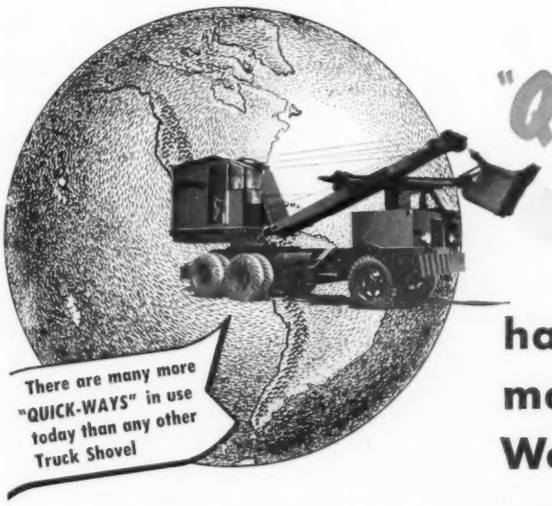

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C&E's Ray Day, left, gets some details from Fred Lichtenstern, who runs the cooling plant.

Folsom Dam: Checkrein On the American River

(Continued from preceding page)

ing and crushing equipment is Telsmith. All sizers and classifiers are Dorr. All sand screws are Telsmith or Wemco. The entire conveyor system is Barber-Greene.

The plant is set up to produce 275 cubic yards per hour, and the 60,000-ton capacity in each of the surge piles permits operations to continue if any part of the plant needs shutting down.

At the river receiving bins, sand is sent on up to the cooling plant as one material. The other materials, however, are combined on the common conveyor system, and rescreened when they reach the batch plant. In passing from this hopper to the batching and cooling plant, the material moves across the American River on a high suspension bridge 800 feet long. This first conveyor flight across the bridge consists of 800 feet of flat grade, along with 160 feet of conveyor pitched on a 3 per cent down grade. The second flight is 640 feet long, and is flat. The third flight is 620 feet long, and is flat. The fourth flight is 560 feet long, and rises on a 10 per cent grade. The fifth flight is a Barber-Green conveyor belt, and is 720 feet long ascending on an 18 per cent grade.

All conveyors are powered by 440-volt motors, with horsepower to match the loading needs of a 30-inch belt. Speed of this long delivery system is based on 525 fpm, and the belt is capable of delivering 550 tons an hour.

Big Cooling Plant

On the left abutment above the dam, set up in conjunction with the batch plant, the world's largest cooling setup of its type has been erected. The purpose of this cooling plant is to pull the heat from concrete materials so that the 50-degree specified temperature at time of placement will not be exceeded. The refrigerating plant is divided into four systems, each serving a specific function, as follows:

1. Ice-making system: The ice-making system, which will produce the amazing output of 30,000 pounds an hour on a continuous-flow basis, is designed for hot-weather concrete-batching use. Ice weighed into a concrete batch will absorb heat while melting, lowering the temperature of the mix constituents.

The ice-making arrangement consists of 12 York Flakice (Model DER-150A) units, operated by 2 York DW 8-cylinder 6¾ x 5 compressors, driven by 250-hp motors and assisted by 2 York rotary boosters. The continuous ice discharge drops to ice screws on the bottom floor of the plant, and is taken by elevator to the top floor and dropped to 1,700-ton storage bins. The ice passes to the batch plant through an ice-screw conveying system.

2. Brine-cooling and air-handling system: To chill the various rock aggregates prior to batching, a cold air and brine system was designed as one of the principal components of the refrigerating plant. Glycol brine is used in this system. The brine is supplied to a pair of York brine coolers and circulated up to coils in a fan room on the second and third floor at 18 degrees. Brine is cooled by two York Duplex 450-hp compressors.

There are two fan rooms for the forced-air system, each containing an American Blower fan unit circulating 95,000 cfm per machine. One fan supplies cold air for ¾ to 1½-inch and 1½ to 3-inch aggregate, while the other supplies chill to the 3 to 6-inch and 6-inch plus cobbles. The fanned air passes through five stacks of coils containing chilled brine. There is a common cold-air return from the top of the batch plant to the fans, and return air is washed through two sets of American Refrigeration washers to remove dirt and foreign matter.

3. Water-cooling system: The water-cooling system furnishes chilled water at 32 to 33 degrees to ice-making machines, circulating water through the Fuller-Kinyon cement-cooling screws, and makes available chilled batching water in

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addition to flake ice available from that unit. Water is chilled in a York IK cooler, operated by two York 10 x 10 compressors with 150-hp motors. Water is pumped from the American River by deep well turbines, which raise the water to a reservoir at the top of the hill near the plant.

4. Ice storage and handling system: The function of the ice storage and handling system is obvious: to keep ice fragments cold while in storage prior to batching and while the material is moving from manufacture to storage. The ice-storage room, like most of the plant, has excellent insulation, and is chilled by a York 6 x 6 compressor. The same machine also refrigerates the tunnel around the Flakice machine, the storage room, and the ice elevator.

In general, the refrigeration plant is one of the most advanced yet set up on a dam. All its brine lines are cork insulated. All refrigeration equipment is located on one floor, reducing the amount of expert labor necessary. Electrical equipment, too, is in one location. The plant is safe because of these reasons, and in its first shakedown year of operation not a single lost-time accident was chalked up for this installation.

Automatic Batching Facilities

The batch plant was made for Folsom Dam by C. S. Johnson Co. The plant is fully automatic, has a capacity of 225 cubic yards per hour, and has storage bins which will allow concrete production to go on for three hours in case of any breakdown in another part of the concrete setup. The plant is set up near the left abutment, above the crest elevation of the dam, which means that all mixed concrete can be dropped into the structure.

A railroad spur, running beneath the plant, leads out to the placing trestle.

The full automatic features of the plant permit concrete to be mixed at high speed by weighing and proportioning without a human factor. Batches are weighed and recorded automatically, and dropped to four Koehring 4-yard tilting mixers mounted on a platform below. The plant has bins for cement, sand, ice, and four sizes of rock aggregate, with a central control room in its heart where plant operator R. N. Fowler works at the big central panel dotted with flashing signal lights to control the automatic output of concrete.

Two principal mixes are being batched. The mix for the exposed faces of the main dam consists of a 6-inch cobble size (actually 9-inch) with a 4-bag cement factor per cubic yard. The leaner mix on the dam interior consists of a 2½-bag batch, also with the same size large cobbles. The lean mix on the interior of the dam not only saves money on that material, but also reduces the heat of hydration. Aeralon, a Dewey & Almy air-entraining agent, is also being used to improve workability of the mix, as well as permitting the use of less sand and more cobbles. Although the aggregates have normal weight, the Folsom Dam concrete has thus far run approximately 158 pounds to 160 pounds per cubic foot.

Compressive strengths will be checked by the extraction of 10-inch cores from the finished masonry, which will then be run through strength-testing equipment.

The Koehring tilting mixers at the batch plant discharge to a common hopper, which in turn transfers to two railroad trains. Each train consists of a Caterpillar diesel-driven locomotive, and a flat-bottom rail-

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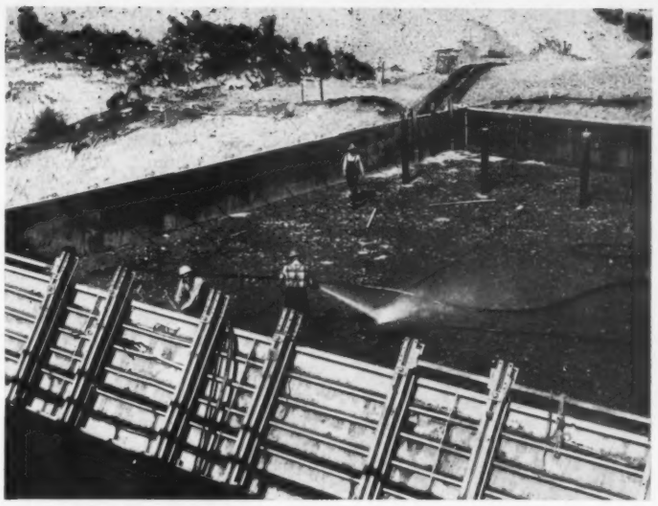

An air-water blast is used for removal of laitance on flat joints. Blaw-Knox forms and Richmond anchors are in place.

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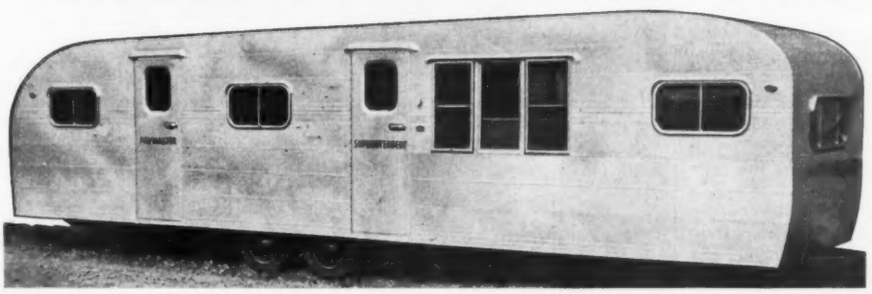

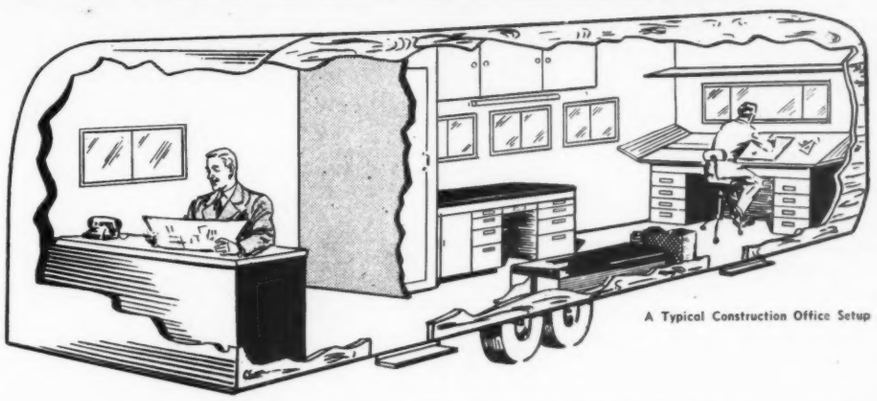

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Folsom Dam: Checkrein On the American River

(Continued from preceding page)

road car containing circular receptacles for the concrete buckets. Each trainload carries four Blaw-Knox concrete buckets filled with 4 cubic yards of material. The fifth bucket position is left vacant, in order to pick up the concrete bucket being handled at that moment by the placing crane.

The railroad track leading from the batch plant out to the trestle has the necessary switching arrangements so that the two trains can alternate properly in carrying the material.

Concrete Placement

All of the main dam, with the exception of a few small portions in the spillway bucket, can be reached by cranes mounted atop the placing trestle. The placing trestle is the same one used for construction of Bull Shoals Dam, and Robert E. Nebel, who was connected with that operation under Harvey Slocum, was hired by Savin to supervise its erection at Folsom.

Placing cranes consist of a Colby double-cantilever machine, and two Washington revolving cranes, gantry-mounted. Railroad tracks passing beneath these machines permit them to pick up the concrete buckets and swing them directly into the concrete pours.

The Colby double-cantilever crane has arms which extend 146 feet from the center line of the machine, and the load capacity is 22,000 pounds at the extreme end of these cantilever booms. The Washington revolving cranes, equipped with 110-foot booms, have a minimum lift capacity of 20,000 pounds with the boom raised at 110-foot radius. The lifting capacity increases to 28,000 pounds at 100-foot radius; 34,000 pounds at 90-foot radius; 42,000 pounds at 80-foot radius; 52,000 pounds at 70-foot radius; 66,000 pounds at 60-foot radius; 86,000 pounds at a 50-foot radius; and an extreme lift of 90,000 pounds at 40-foot radius. This lift, of course, is off the main hook.

Equipped with a 130-foot boom, the Washington revolving cranes have lifting capacities ranging from 12,000 pounds on a flat boom to 52,000 pounds at 70-foot radius.

The forms consist of Blaw-Knox steel cantilever panels, which are raised by small hand hoists as the pours progress, and which permit 5-foot lifts to be placed. There was considerable concern expressed in the early planning stages of the project that the exposed concrete around the form anchorages would spall. Savin, however, selected Richmond double-coil anchorages, which are mounted on the forms before each monolith is started. The first coil of these patented anchors is designed to take the form bolts while the second coil simply gives added and positive anchoring capacity.

There has been no spalling whatever as a result of using these Richmond anchors, according to Project Engineer E. G. Summer. The anchors are easy to install, give little trouble, and above all, hold positively. The closest spacing of these anchors is 4 feet, where the form panels butt, with a 6-foot spacing otherwise.

The 5-foot-high concrete monoliths are being placed by conventional methods. A layer of grout is first brushed in thoroughly, and then the first lift of concrete is placed and vibrated. When enough area of this first lift is in to accommodate a second lift, it is placed. This stairstep operation is repeated with a third and final lift which fills the block to the top of the forms. The stairstep operation, about 30 or 35 feet long over-all, then moves from one side of the block toward the other.

The concrete crew in each block is relatively small, consisting of a foreman, a signalman, and six laborers. The laborers divide the work up to give rest periods between the minutes of strenuous exercise. Two large Jackson 2-man vibrators are used in each monolith, and these are handled by four men. The other men take turns brushing in grout, handling air and communications lines, and doing other such work. At regular intervals they, too, take their turns on the vibrators and permit the vibrator men to take a rest on less strenuous work.

While the concrete is still green the flat concrete joints are cleaned by a blast of air and water which removes the excess laitance and leaves the exposed aggregate surfaces clean and in condition to bond properly when the next batch of grout is brushed in.

Specifications permit the use of membrane-type cure where the dam is expected to be covered by some portion of earth. In these locations, Sherwin-Williams white-pigmented concrete-curing compound is used. The remainder of the dam is being

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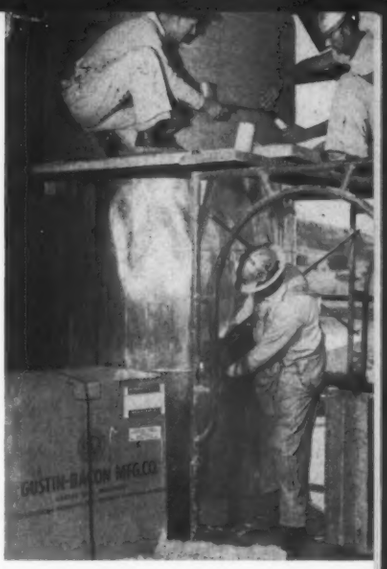
When CONTRACTORS AND ENGINEERS visited the job, Savin had completed many of the low foundation blocks—which were again covered by gravel and sand because of the January flood—and a considerable number of the monoliths along the left abutment were also in. The 1953 construction season should see Folsom Dam's main concrete barrier developed to a point where it will show up significantly by year's end, in spite of delay caused by the flood and by construction scheduling. In any case, project officials expect to finish on time and deliver the dam to its building agency. Folsom will then take its place beside other key structures in the Central Valley Plan to control floods, provide recreation, and deliver power for many years to come.

And if the Corps of Engineers concrete technicians have done their job as well as they believe, the dam will stand as a lasting monument to the memory of everyone who participated for hundreds of years after all are gone.

Ducts Are Insulated on Folsom Dam Job

• INSULATION of the large air ducts was only one of many problems faced by contractors as they prepared to supply 50-degree concrete for the Folsom Dam project on the American River in central California. The duct system created a special insulating problem due to the fact that air at 20 degrees F was to be carried. Supply ducts 4½ feet in diameter and 50 feet long, and return air ducts 8 feet in diameter and 100 feet long were fabricated of heavy gage metal with deep corrugations.



The workmen on the scaffold are sealing joints in insulation with waterproof cement. An aluminum protective covering is applied by the man below.

The normal application of insulating board cut into beveled lags and secured with adhesive was deemed impractical because of the potential formation of ice in the corrugations. The solution to this problem came through the use of Ultralite No. 75—¾-pound density insulating material.

Gustin-Bacon Mfg. Co., manufacturer of Ultralite, made a special run for this project of material 6 inches thick faced on one side with Sisalkraft paper (for vapor seal) with 2-inch tabs. This 6-inch insulation was pulled tightly around the ducts to fill the deep corrugations, thus eliminating the possibility of ice pockets. A minimum of 4 inches of insulation was retained.

After the insulation was applied and held in place with fibrous glass-tying cord, the end and butt joints of the Sisalkraft paper were sealed with waterproof cement and stapled.

The insulation was then covered with a weatherproof and fireproof covering of Childers corrugated aluminum 0.006 inch thick. This material was wrapped around the pipe outside the insulation. Joints were sealed with waterproof cement, stapled, and additionally secured with aluminum bands.

Ultralite insulating materials were used in various forms for insulating other portions of the cooling system of the concrete plant which is now producing the thousands of yards of 50-degree concrete required for Folsom Dam.

Symons Clamp Names Mock

Vernon L. Mock, a specialist in precast concrete and the manufacture of concrete products, has been appointed sales representative in the southwest for Symons Clamp & Mfg. Co., Chicago, Ill.

Mr. Mock will be in charge of Texas and Oklahoma sales to meet the increasing demand for Symons concrete-forming system.

...since Switching To

...ving a mountain of sand and gravel laid down by a ...cial stream thousands of years ago requires skill *plus* ...uipment you can count on. You can count on Tuffy Drag... ...es for greater abrasive resistance and reduced handling ...ts.

Other Specially Designed Tuffy's For Special Uses

Tuffy SCRAPER ROPE

Tuffy is tailored to take • Greater drum crushing abuse • Sharper bends over smaller sheaves • Angle pulls through swivel mounted sheaves. • Crawling on flanges of guide rolls and edges of sheave housing • Multiplied impact shock of load on slack lines.

Tuffy DOZER ROPE

No need to throw away 40′ to 50′ of good rope when 10′ or so is crushed or cut. With a reel of Tuffy Dozer Rope, mounted on your dozer, you feed only enough through the wedge socket to replace *only* the damaged part . . . get up to 300% increased service! And, you can make the cut and have your dozer back at work in less than *half* the usual time!

Tuffy SLINGS

9 part machine-braided wire fabric construction fights off knots and kinks, stands up longer than ordinary wire rope. Proof-tested to twice safe working load.

SEND FOR THESE FREE FOLDERS

union Wire Rope corporation
Specialists In Wire Rope and Braided Wire Fabric
2260 Manchester Ave., Kansas City 3, Mo.

☐ Tuffy Dragline ☐ Tuffy Scraper
☐ Tuffy Dozer ☐ Tuffy Slings

Firm Name_____
By_____ Title_____
Address_____ City_____ State_____

The Model 6 Vermeer Pow-R-Ditcher is self-powered. It digs to a maximum of 6 feet.

Self-Powered Ditcher

A self-powered ditching machine is manufactured by Vermeer Mfg. Co., Pella, Iowa. The Model 6 Pow-R-Ditcher will dig up to 18 inches wide at a regulated speed of 1 to 3 fpm; maximum depth is 6 feet.

The unit is recommended for tiling; laying gas, water, and sewage lines; and for digging foundation trenches. It may be hooked up to a car, truck, or jeep for transportation. The wheel arrangement permits digging on slopes.

The ditcher is powered by a Wisconsin air-cooled engine. It is available in two other models: Model 24 which has a 24-inch digging width, and Model 6-V with an adjustable V-blade for digging drainage ditches.

For further information write to the company, or use the Request Card at page 18. Circle No. 437.

Pneumatic Screwdriver

A hand-sized pneumatic screwdriver is shown in a folder from the Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill. It will handle No. 8 free-running machine screws and No. 5 self-tapping screws. The tool is 7 15/32 inches long and weighs 1⅛ pounds.

A bit and finder, a 1¼-inch x 8-foot hose assembly, and a special lubricant are standard equipment.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 470.

Hydraulic Device Controls Moldboard

A device which automatically controls the inclination of the moldboard of a power grader is said to make it possible to shape the crown of a road with an accuracy of plus or minus 1/64 inch per foot. For a grader with hydraulic controls the device consists of an auxiliary hydraulic system including a hydraulic pump. A 4-way solenoid-controlled valve is connected in parallel with the main lines to the hydraulic rams which operate the moldboard.

The solenoids are actuated by two opposing mercury switches. As the moldboard moves up or down from the required inclination it closes a current in one of the opposing mercury switches, which in turn actuates the solenoid-controlled valve to bring the moldboard back to the required inclination. A clinometer registers the inclination of the moldboard.

A fluid motor is connected to the moldboard drive-shaft by chain and sprocket in a grader with mechanical moldboard controls.

Patents are held by Frank V. Bell, Wentworth County Engineer, Hamilton, Ontario, Canada.

Adjustable Protractor

An adjustable protractor draws any number of angles from zero to 180 degrees from one position. Its upper rule arm swings to the desired angle and an adjustment knob locks. A magnifier is built in over the calibration scale.

The Tractograf protractor is made of clear plastic and has beveled ruling edges. It is 2 inches wide and 7 inches long and can be carried in a shirt pocket. Calibrations are in 1 and 5-degree divisions.

For further information write to Way-Mac Mfg. Co., 8112 Melrose Ave., Los Angeles 46, Calif., or use the Request Card at page 18. Circle No. 389.

Data on a Line of Jacks

Screw, lever, and hydraulic jacks are shown in literature from The Joyce-Cridland Co., 2027 E. 1st St., Dayton 3, Ohio. The brochure illustrates the company's line and gives lifting capacity, height, rise, and weight of all models.

Among units shown are single-acting automatic-lowering jacks of 5 to 20-ton capacity, and geared-lever jacks of 35 to 50-ton capacity. Others illustrated are jacks for handling cable reels, screw-type journal jacks, and pulling and pushing jacks.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 459.

"Our Dodge trucks just go and go!"

. . . says **CHARLES BENDA**, *Owner, Chuck's Excavation Service, Chicago, Ill.*

"Contract hauling and excavation work can be rough work sometimes. You never know from one day to another what your next job will be like. That's why I need trucks that can handle any kind of job that may come up. And Dodge is my choice down the line!

"That Dodge power is as steady as a mule. It has the ability to pull full loads out of deep basement excavations, and the dependability to keep coming back for more. My Dodge trucks are plenty economical, too. I haven't found any other make that can come close to Dodge for good gasoline mileage!"

Why new DODGE *"Job-Rated"* TRUCKS are a better buy for Construction Men

HIGH-POWERED FOR HEAVY HAULS!

Dodge gives you the might and muscle to move those big loads *in a hurry!* Seven hefty power plants, three brand-new—from 100 h.p. to 171 h.p. It's real economical power, too. High compression ratios, 4-ring pistons, chrome-plated top rings and a host of other features combine to help keep your gas and oil expense at rock-bottom levels. And extra-powerful dual primary brakes, in 1- through 4-ton models, assure safer stops with less pedal pressure!

BIG PAYLOADS FOR BIGGER PROFITS!

With a Dodge *"Job-Rated"* truck, you can haul man-sized loads on a small-sized budget! New, bigger load capacities on many models enable you to carry more money-making payload every time out. Moreover, those rugged Dodge frames, sturdy axles and extra-strong springs are built to withstand toughest use for years without breakdown. See your Dodge dealer for the full story on Dodge extra value. He's making mighty good deals right now.

DODGE

"Job-Rated" TRUCKS

"ALL WEATHER"

DECALS

FOR LARGE & SMALL NEEDS

Save 25% NO SALESMAN TO CALL YOU SAVE IT ALL

FOR PRICES AND SAMPLES WRITE TO

STORER DECAL CO.

1558 SO MARKET WICHITA, KANSAS

10 DAY DELIVERY

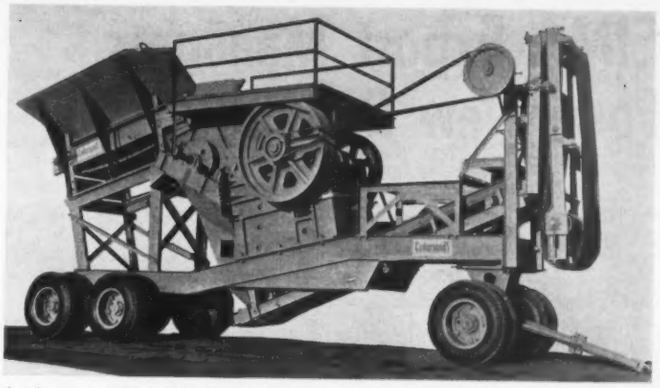
Jaw-Crushing Plant Has Vibrating Grizzly

A new Cedarapids portable primary crushing unit has a vibrating grizzly that acts as a by-pass for materials under crushing size. It eliminates dirt and fines from material before it reaches the crushing chamber. Material passing through the grizzly bars drops into the by-pass chute and discharges onto the under-crusher conveyor which carries it to the next crushing unit. This reduces the load on the jaw crusher, and in effect makes for a larger crushing space and higher capacity, acording to the manufacturer, The Iowa Mfg. Co., 916 N. 16th St., Cedar Rapids, Iowa. Model AAA-GR is particularly suitable for operations where a high percentage of the raw material is below the 2½ to 6-inch range in size.

The vibrating grizzly is also said to provide an advantage in wet or sticky material that would not normally pass through a stationary grizzly, or which might stick to the crusher jaws causing compaction or plugging of the crusher. According to the manufacturer, only the larger rock reaches the crushing chamber, so that the crusher stays free from sticky clay or other compacting material.

The vibrating grizzly has a circle-throw action. The deck measures 40 inches x 4 feet and is available with various optional decks with openings ranging from 2½ to 6 inches.

The new crushing unit has a 22 x 36-inch Cedarapids jaw crusher, but can also be obtained with a 25 x 40-inch crusher. There is also a 36-inch x 8-foot apron feeder, a 7 x 4-foot hopper, and a channel-type clutch-controlled 30 x 28-foot delivery conveyor with a 10-foot discharge clearance. A 36-inch x 12-foot feeder is optional.



A vibrating grizzly on Model AAA-GR, the Cedarapids portable primary crushing plant, by-passes dirt and fines before the material reaches the jaw crusher.

The entire unit is mounted on a pneumatic-tired semitrailer with tandem rear axle.

For further information write to the company, and request Form No. 1483, or use the Request Card that is bound in at page 18. Circle No. 352.

CLEAVER-BROOKS—DISTRIBUTORS

ALABAMA—J. D. Pittman Tractor Co., 500 N. 28th St., Birmingham 2; Burford-Teothaker Tractor Co., 2521 Halls Mill Rd., Mobile; P. O. Box 1591, Montgomery 2.
ARIZONA—Arizona Cedar Rapids Co., 1726 W. Jackson St., Phoenix.
ARKANSAS—Clark Equipment Co., Cantrell Rd. and Booker St., Little Rock.
CALIFORNIA—Casson Hale Corp., 22101 Meekland Ave., Hayward; Standard Steel Corp., 5001 Boyle Ave., Los Angeles 58.
COLORADO—H. W. Moore Equipment Co., 6th and Acoma Sts., Denver 1.
CONNECTICUT—Deephouse Equipment Co., 160-170 Farmington Ave., Berlin.
D. C., WASHINGTON 2—Hovey-King Co., 314-316 Randolph Pl., N.E.
FLORIDA—Florida-Georgia Tractor Co., Beaver and Huron Sts., Jacksonville; 3139 N. Miami Ave., Miami; P. O. Box 1511, Lakeland; Box 987, New Quincy Highway, Tallahassee; P. O. Box 2248, Tampa.
GEORGIA—W. C. Caye & Co., Inc., 787 Windsor St., S.W., Atlanta.
ILLINOIS—Hillman Equipment Co., Box 170, Bloomington; 2000 N. Hawthorne, Melrose Park; Wisner, Inc., 621 Main St., Peoria; 1319 Broadway, Rockford, 528 - 11th St., Rock Island.
IDAHO—Intermountain Equipment Co., Broadway at Myrtle St., Boise; 210 N. Fourth, Pocatello.
INDIANA—Reid-Holcomb Co., 1815 Kentucky Ave., Indianapolis.
IOWA—James W. Bell Co., Inc., 1720 1 Ave., N.E., Cedar Rapids; 2818 Fifth Ave., Des Moines 13.
KANSAS—The Victor L. Phillips Co., Box 1557, Wichita.
KENTUCKY—Bogle Equipment Co., 801 E. Third St., Lexington 47; 1212 S. Seventh St., Louisville.
LOUISIANA—Frank P. Fischer Engineering Co., 7924 Maple St., New Orleans 18.
MAINE—Parker-Danner Co., Riverside Drive, Augusta.
MASSACHUSETTS—Parker Danner Co., 25 Factory St., Hyde Park 36; 71 Needham St., Newton Highlands.
MICHIGAN—Eddy & Co., 2500 S. Pennsylvania Ave., Lansing 4; Straits Engineering Co., 400-2 Ashmun St., Sault Ste. Marie.
MINNESOTA—Ruffridge-Johnsen Eq. Co., 250 Tenth Ave. S., Minneapolis.
MISSISSIPPI—Watkins-Aldridge Equipment Co., 912-916 S. State St., Jackson.
MISSOURI—The Victor L. Phillips Co., 16th and Baltimore Sts., Kansas City; The George F. Smith Co., 5215 Manchester Ave., St. Louis.
MONTANA—Hall-Perry Machinery Co., 304 Pratt Bldg., Billings; 802-812 E. Iron St., Butte; Coram; P. O. Box 307, Great Falls; Missoula.
NEBRASKA—Anderson Equipment Co., 200 Merchants Nat'l Bank Bldg., Omaha 8.
NEW HAMPSHIRE—Parker-Danner Co., 507 Elm St., Manchester.
NEW JERSEY—R. E. Brooks Co., Route 17, Box 17, Hasbrouck Heights.
NEW MEXICO—R. L. Harrison Co., Inc., 1801 N. Fourth St., Albuquerque.
NEW YORK—Syracuse Supply Co., 76 Wall St., Binghamton; 2080 Military Rd., Buffalo 17; R. E. Brooks Co., 50 Church St., New York; Syracuse Supply Co., Portville Road, Olean; Van's Equipment Sales, Inc., Routes 9 and 20, Rensselaer; 1349 University Ave., Rochester; Syracuse Supply Co., 294 Ainsley Drive, Syracuse.
NORTH CAROLINA—North Carolina Equipment Co., P. O. Box 5006, Asheville; P. O. Box 1205, Charlotte; P. O. Box 128, Guilford; P. O. Box 655, Wilmington; 3101 Hillsboro St., Raleigh.
NORTH DAKOTA—Northwestern Equipment, Inc., 715 11th St., Bismarck; 901 Eighth St., Devils Lake; P. O. Box 110, Dickinson; P. O. Box 152, Fargo; P. O. Box 335, Minot; P. O. Box 626, Wahpeton.
NEVADA—Sierra Machinery Co., 307 Morrill Ave., Reno.
OHIO—The W. W. Williams Co., 914 Main St., Cincinnati; 18301 Brookpark Rd., Cleveland 11; 935 W. Goodale Blvd., Columbus; 1260 Conant St., Maumee.
OKLAHOMA—The Victor L. Phillips Co., 1101 E. Archer, Tulsa; 1222-24 W. Main St., Oklahoma City.
OREGON—Howard-Cooper Corp., Highway 99E, P. O. Box 443, Albany; Highway 99, P. O. Box 86, Central Point; P. O. Box 1, Coquille; First and Van Buren, Eugene; 5821 N. E. Gilsan St., Portland 13; 225 E. 2nd Ave., S., Roseburg.
PENNSYLVANIA—The Capitol Equipment Co., 5100 Paxton St., Harrisburg; Alan A. Wood, 1640 N. Broad St., 905 Hardt Bldg., Philadelphia; Dravo-Doyle Co., 2601 Preble Ave., N.S., Pittsburgh 12.
RHODE ISLAND—Parker-Danner Co., 139 Allens Ave., Providence.
SOUTH CAROLINA—South Carolina Equipment Co., 444 Gadsden St., Columbia.
SOUTH DAKOTA—Sioux Road Equipment Co., 500 E. Sixth St., Sioux Falls; Box 941, Rapid City.
TENNESSEE—Wilson-Weesner-Wilkinson Co., 202 W. Morelia Ave., Knoxville; Tri-State Equipment Co., 124 E. Calhoun Ave., Memphis; Wilson-Weesner-Wilkinson Co., 310 S. 2nd St., Nashville.
TEXAS—Alamo Iron Works, Brownsville; Corpus Christi; Tri-State Equipment Co., 500 E. Overland St., El Paso; Conley-Lott-Nichols Machinery Co., 1311-19 S. Ervay St., Dallas 1; Conley-Lott-Nichols Company, 3601 Avenue H, Lubbock; Tri-State Equipment Co., P. O. Box 472, Odessa; Alamo Iron Works, Santa Clara & Montana Sts., San Antonio 6.
UTAH—Kimball Equipment Co., 222 W. 17th St., S., Salt Lake City 10.
VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 39th St. and Killam Ave., Norfolk; Natural Asphalt Corp. of Virginia, 1901 Hamilton St., Richmond.
WASHINGTON—Glenn Carrington & Co., 91 Columbia St., Seattle 4; Howard-Cooper Corp., 5045-55 - 4th Ave., S., Seattle 8; Intermountain Equipment Co., 611 E. Sprague, Spokane.
WEST VIRGINIA—West Virginia Tractor & Eq. Co., P. O. Box 473, Charleston; P. O. Box 587, Clarksburg.
WISCONSIN—The Stone Manufacturing Co., 321 N. 25th St., Milwaukee 3; Badger Equipment Sales, Inc., Route 2, Thiensville.
WYOMING—Studer Tractor & Equipment Co., East Yellowstone Highway, Casper.
ALASKA—Glenn Carrington & Co., c/o Westward Hotel, Anchorage.
CANADA—Mussens Canada Ltd., Church St., New Brunswick, Fredericton; Coleman Machinery Co., Ltd., 101 Upper Water St., Nova Scotia, Halifax; Mussens Canada, Ltd., 65 Colborne St., Montreal 3; Ontario Equipment & Supply, Ltd., 111 Merton St., Toronto, Ontario; Frost Machinery Co., Ltd., 971 Erin St., Winnepeg, Manitoba; International Agencies & Machinery Co., 2315 Cambie St., Vancouver, B. C.; Mussens Canada, Ltd., Charest Blvd., Quebec.

NEED LOW-COST "Mobile" STEAM on the spot?

This Cleaver-Brooks boiler *on wheels* delivers dry steam in 30 minutes or less after arrival

CONTRACTORS who need steam on-the-spot and *in a hurry* depend on Cleaver-Brooks mobile boilers. They know they get plenty of steam the *easy way*. These self-contained boilers can be towed by truck or tractor at a 35-mile clip, job-to-job or moved anywhere on job site. On arrival, one man can hook up water and steam lines . . . start oil burner, and in 30 minutes or less, you're all set with a good "head of steam."

Fully self-contained, with oil and fuel tanks built in, these Cleaver-Brooks mobile boilers require minimum maintenance. They're all-weather protected. No need to bank fires at night for an early start in the morning. Forced draft, four-pass fire tube design, high efficiency oil burner plus completely integrated automatic controls, assure guaranteed 80% efficiency. You get fast steam response for fluctuating demands from full loads down to 30% of rating.

You can use this handy all-year, all-weather boiler for contract or subcontract jobs. Work like this will keep you busy: Pile driving, extracting, winter concrete thawing, asphalt plant bitumin heating, ready-mix concrete operations, and many other profitable jobs. Available in two sizes — 80 and 125 hp. — trailer or skid mounted for installation on truck or trailer.

See your nearest Cleaver-Brooks Distributor, or write direct for details. Cleaver-Brooks Company, Dept. H, 397 E. Keefe Ave., Milwaukee 12, Wis.

Cleaver-Brooks

Pioneers and Originators of Tank-Car Heaters • Bituminous Boosters "Deuce" • "Peak-Temp"

Ask for bulletin RM-108 which fully describes Cleaver-Brooks Mobile Boilers.

CIMA Export Managers Form New Division

Construction Equipment Export, Foreign Credit, Government Regulations Are Discussed at Chicago Meeting

Officers of the new CIMA division are, left to right: Paul E. Fulford, chairman of the program committee; Walter Buehl, secretary; Frank P. D'Aquilla, chairman; and Russell E. Stewart, vice chairman.

• SUPPLYING American construction equipment to the nations of the world presents some interesting problems which challenge the ingenuity of American industrialists. Some of these problems were discussed at a meeting of the newly organized Export Managers Division of Construction Industry Manufacturers Association, held at the Palmer House in Chicago, Ill., May 8, 1953.

An example of the many problems is that of instructing dealers and service men as well as owners and operators in the proper use and maintenance of the equipment. That these people do not, in most cases, read the language in which American service and instruction manuals are printed is only one of many complicating factors.

The extensive use of photographs and charts in such manuals is suggested as the means of reaching those who do not understand the printed text. Movies and strip film with the commentary in the native language are aids being used by some manufacturers to assist their foreign dealers.

With the warning that "only where construction machinery is used economically will its use continue after Government subsidies cease", Paul L. Molnar of International Harvester's Foreign Operations staff opened the morning session of the day-long meeting.

Three Basic Factors

He enumerated three factors which he considers essential to a long-range view of the export business. First, Molnar pointed out that the equipment must be good. It should be thoroughly field-tested in the domestic market before being exported and should be sold only in standard export units without all the optional attachments offered to domestic purchasers. The equipment must give good operating results under normal use. This implies that the foreign dealer and user must be instructed in how to use the equipment and what to expect and not to expect from it.

The second factor, that of sufficient supply, is a major consideration of manufacturers engaged in export. Anticipating what amounts of which equipment will be bought in certain countries requires the combined efforts of the foreign dealer and the American manufacturer, together with some best guesses as to the political activities of the several countries and the availability of exchange. Molnar suggested the desirability of keeping the percentage of total production which goes into export low, and spreading the activity over as large a foreign territory as possible.

His third essential, that of a good dealership organization, involves not only the problems common to domestic dealers, but also the complications introduced by language, exchange, distance, and governmental restrictions. Among other attributes, a foreign distributor must have the ability to get import permits from his government, and to secure exchange to enable him to pay for the equipment in American dollars. In other words, the very best businessman must also have some political connections in order to be a successful foreign equipment dealer.

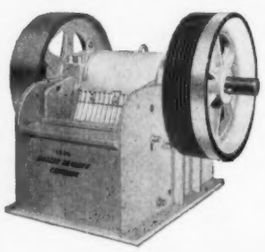
Foreign Credit

Following up on the subject of exchange and credit, S. M. Kerswil, credit manager of Westinghouse-LeTourneau, Inc., discussed the credit manager's view of construc-

A 3 IN 1 ADVANTAGE

WITH TWINDUAL ROLLS

3 SEPARATE CRUSHING OPERATIONS IN 1 PORTABLE ROCK PLANT

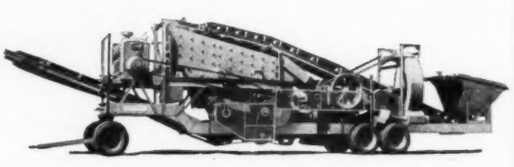


1ST. STAGE — Overhead Eccentric Jaw Crusher

Rock or gravel is fed by apron feeder to jaw crusher. Both feeder and jaws can be skid mounted for simple removal. Bar grizzly and by-pass relieves crusher of material not requiring primary reduction — reduces unnecessary wear and clogging. Pacemaker Jaw Crusher produces two distinct blows with each revolution of Universal's overhead eccentric shaft, famous in the industry for 47 years. Primary blow at the top of the jaw and secondary blow at the bottom. Force feed action and fast discharge results in high capacity, more production, top profits. Roller bearings are equipped with piston ring seals to keep lubricant in, dirt and grit out.

OTHER PROVEN UNIVERSAL PLANTS WITH THE EXCLUSIVE TWINDUAL ROLLS

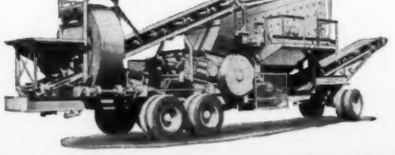
293QS Gravel King A complete portable gravel crushing, screening and loading plant with three stages of crushing, two separate screening operations. 1824 or 2036 RB jaw crushers.



TDM24 Master Gravel Plant Especially profitable where a highly mobile, low weight plant is required for a top capacity, flexible operation. Three full stages of reduction. 1024 RB jaw crusher.

546P Portable Primary Crusher 1824, 2036, 2436 or 3042 RB Jaw Crushers. Combined with a TDS Secondary Twin Dual Gravel plant as shown above, you have a two-unit, three-stage quarry plant.

TDS30 - TDS40 Portable Secondary Plants Complete two-stage roll crushing, screening and loading plants. 30 or 40 inch TwinDual roll crushers.



tion machinery export. Stressing the need for credit, he stated that many foreign purchasers must now make payment in full in American dollars at the time of placing their orders. In many cases this means payment two to six months in advance of delivery of the equipment.

Credit ratings, Kerswil pointed out, usually depend on financial statements, agency reports, bank information, and information published in periodicals. A complete lack of uniformity in these items from foreign countries frequently makes it very difficult if not impossible to determine whether or not the purchaser's credit is good.

Stabilization of currency on a world-wide basis and standardization of credit information would greatly lessen the worries of the credit manager in export trade.

Kerswil indicated that countries which can export raw materials such as tin, rubber, tungsten, manganese, uranium, etc., to the United States are the potential customers of the construction-equipment manufacturers. Getting their business and keeping it are the challenges which face the foreign sales and credit departments.

The part of Government rules, regulations, and restrictions in the export of construction equipment was discussed by Alphonse F. Brosky, chief of the construction-equipment section, Office of International Trade, U. S. Department of Commerce.

At the luncheon session, William T. McCormick, deputy special assistant for small business, Mutual Security Administration, discussed the relationship of mutual security to business opportunity in the world market.

The Export Merry-Go-Round

The afternoon session called "The Export Merry-Go-Round" was a question and answer period. The four speakers previously mentioned served as a panel together with Leslie A. Dykes, Oliver Corp.; M. B. Garber, Thew Shovel Co.; and Paul E. Gleicauf, Goodyear Tire and Rubber Export Co. Paul E. Fulford, Westinghouse - LeTourneau, Inc., served as moderator of the panel.

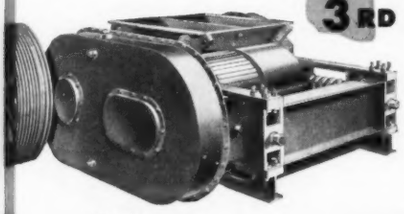
Questions were submitted in writing, some in advance of the meeting and some during the earlier sessions. These were classified and presented in more or less condensed form to the members of the panel for discussion.

Approximately 15 per cent of the construction machinery manufactured in the United States last year was exported to countries other than Canada. While this represents an increase over previous years, it still indicates that American manufacturers have only scratched the surface of the export business. Interest evidenced at this meeting indicates that there will be a rapid growth of this branch of the industry in the near future.

Officers of this newest division of CIMA are Frank P. D'Aquilla, chairman; Russell E. Stewart, vice chairman; W. A. Buehl, secretary, and Chester Cotten, treasurer. Paul E. Fulford was chairman of the Program Committee for the May meeting.

From the enthusiasm exhibited by those who attended this initial meeting of the Export Managers Division of CIMA, there can be little doubt that this group will be perpetuated and that future meetings will follow shortly.

UNIVERSAL'S 293Q PACEMAKER ROCK PLANT



2ND STAGE } UNIVERSAL'S Exclusive TwinDual Rolls
3RD STAGE }

The roughing deck of the screen selects only the large oversize from the first stage of crushing and routes it to the roughing rolls of the Twin Dual Roll Crushers. Roll feed utilizes full width of rolls. 30% to 50% of the material crushed in this second stage is finished and removed when returned to the screen. 15% recirculates and the balance is reduced by the third stage. The finishing deck of the screen removes specification material resulting from any of the three stages of crushing. The oversize from this finishing deck is chuted to the finishing rolls of the Twin Dual Roll Crusher.

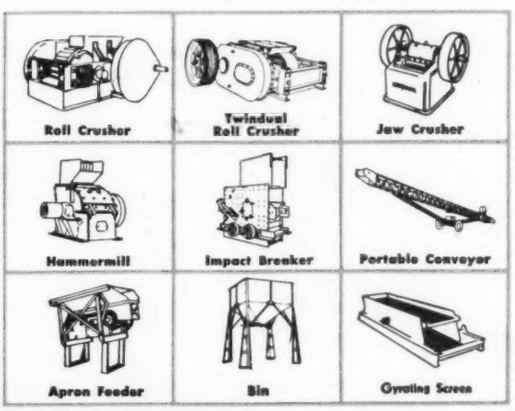
PLUS THESE UNIVERSAL ADVANTAGES

Portability . . . saves time in moving and setup, cuts operating costs on the job. Apron feeder and jaws can be skid mounted to obtain low rear axle weight.

Dependability . . . balanced construction, the even, steady flow of material at every stage of operation cuts "downtime" and maintenance costs.

Capacity . . . again, **Balanced Construction,** big jaws, rolls, screens and conveyors feeding and discharging at capacity—produce maximum tonnage.

Universal's 293Q Pacemaker Rock Plant is acclaimed by owners everywhere as a top producer in the field.



FOR TOP PROFITS BUILD WITH UNIVERSAL SOUNDLY ENGINEERED BASIC UNITS

Whatever your particular crushing, screening, washing, or loading problems might be, Universal equipment invites comparison. For information on the complete Universal line see your nearest Universal distributor or write UNIVERSAL ENGINEERING CORPORATION, 620 C AVENUE N.W., CEDAR RAPIDS, IOWA, a subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois.

When you move, move quickly and easily with Universal Portable Plants . . . and you move on to greater profits.

UNIVERSAL GAVE CEDAR RAPIDS ITS ORIGINAL FAME FOR QUALITY CRUSHERS IN CEDAR RAPIDS SINCE 1906

PMCP UNIVERSAL

ENGINEERED FOR TOP OPERATING PROFITS

New Mortar Mixer Has Telescoping Axle

A new Rex 6-cubic-foot plaster and mortar mixer with a telescopic axle is being manufactured by the Construction Machinery Division of Chain Belt Co. The mixer's wheels can be extended to 40 inches for fast towing from job to job, or the axle may be telescoped so the mixer can be moved through a 33-inch doorway for inside work.

Power from a single-cylinder Wisconsin air-cooled engine is transmitted through a gear reduction running in an oil-tight case by chain drive to the mixer paddle shaft. The paddle shaft is mounted on a prelubricated antifriction bearing. A criss-cross mixing action is obtained by four paddles.

The drum tilts to discharge into wheelbarrows or mortar box.

For further information write to Chain Belt Co., Department PR, 4701 W. Greenfield Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 368.

Grader-Line Literature

New literature describes five models of graders made by Pettibone Mulliken Corp., Speed Grader Division, Rome, N. Y. The folder features a top-view sketch of the Speed Grader that points out the hydraulic controls including the power steering, the large front wheels, and the standard pin-type moldboard. The cast-steel circle has teeth on top and teeth cast with the circle.

The grader is made in four models. There are two 100.2-hp units, and other models of 65, 83, and 107.8 hp. A check-list compares the features of this grader with those of competitive products.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 391.

"Which part of the reservoir services our end of town, dear?"

Mild Steel Electrode

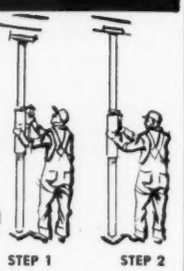
A new improved E6010 electrode for welding mild steel is announced by the Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y. The new electrode is said to offer deep penetration without undercutting, a minimum of spatter, and uniform weld deposits without fingernailing. According to the manufacturer, the deposit solidifies quickly which makes this electrode suitable for welding in vertical and overhead positions.

The 78E electrode is recommended for the fabrication of mild steel, involving plate and rolled sections or castings, fired and unfired pressure vessels, structural frames, pipe lines, and all classes of marine work.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 445.

THE SIMPLE WAY TO SHORE LOADS UP TO 9,900 LBS.

Put Up Safway Shoring in 2 EASY STEPS



STEP 1 — Extend upper member of Safway shoring close to approximate height. Fasten with pin.

STEP 2 — Rotate sleeve nut to elevate head to exact height.

● **It's microadjustable to exact height.** Sleeve turns ¼" per turn. Each thread is tested to 40,000 lbs. Threads are protected against rust and damage.

● **It has up to 9,900 lb. capacity** for 7-foot length . . . a safety factor of 3 to 1. In most cases you need no bracing up to 12 feet and then at greater heights you can use standard Safway tubular steel pivoted cross braces, or lumber.

● **Just 3 shore sizes** cover a complete range from 6 to 15½ feet. Each size has a 5-foot adjustment range. Collar centers upper tube and maintains the load directly overhead. There are three types of heads available for a variety of service conditions.

Why not write today for more facts? Or contact one of the 137 Safway dealers near you.

SAFWAY STEEL PRODUCTS, Inc.
6240 West State St.
MILWAUKEE 13, WISCONSIN

An inner circle Tunneliner pipe section is carried through the completed portion of the tunnel.

New Tunneling Method Uses Elliptical Pipe

Municipal sewers are constructed underground without disturbing the surface in a tunnel-laying process that uses precast, elliptical, reinforced-concrete sewer-pipe sections made by the Lamar Division of American-Marietta Co., 101 E. Ontario St., Chicago 11, Ill.

Key step in the method is the passing of elliptical pipe sections tipped over on their side through the portion of the conduit already laid. With the help of special equipment supplied by the company a sewer-tunnel installation is made with less earth removal and fewer than the usual number of on-the-job laborers necessary in such work. According to Lamar, the finished sewer is stronger and has slightly larger capacity than if built with circular pipe of the same nominal diameter.

A concrete-pipe shaft, which later serves as an access manhole, is sunk as a caisson. As a safety precaution, the initial start of the tunnel is made with longer than standard sections of the pipe jacked into place. Special mud cars that run on tracks carry out excavated material and bring in backfill. A special hook lowers the elliptical pipe, section by section, to the excavation level where the pipe is mounted on its side on an electric car that carries it through the portion of the tunnel already laid. A pipe layer turns the section to laying position while it is still mounted and the car backs it into place.

The car that carries the elliptical pipe backs a section into place against tunneling already in place.

Inner circle pipe, as the elliptical sections are called, is available with wall thickness ranging from 3¾ to 9½ inches and in inner diameters equivalent to 33 to 96-inch round pipe. Laying lengths are 12 to 32 inches. The manufacturer stresses that the reinforced-concrete pipe walls will have a given strength with less wall thickness than other tunneling. The factory-made pipe is tested at the plant for line, grade, diameter, and smoothness to make for a constant hydraulic capacity in use.

In the construction process the Tunneliner method eliminates delays for mining shift and for setting forms or bracing finished work. The manufacturer points out that the mechanical handling procedure cuts accident hazards.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 387.

Buy U. S. Defense Bonds.

Book on Surveying

"Surveying—Theory and Practice," a new book by Raymond E. Davis, professor of civil engineering, and Francis S. Foote, professor of railroad engineering, covers fundamental relationships and techniques—operations common to all branches of surveying. Measuring, plotting angles and distances, and the practice of surveying as extended to entire surveys are discussed.

This is the revised fourth edition, including many rewritten sections such as those on errors, field astronomy, photogrammetric surveying, barometric leveling, and others. There are illustrations—many are redrawn—and new photographs and drawings have been added.

McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y., is the publisher of the book, which sells for $8.00.

THIS *is the* CLAMP...

That is easiest to attach; provides strong, full-circumference grip on the hose; and can be used again and again . . . always with same sure holding power.

"KING" SINGLE and DOUBLE BOLT HOSE CLAMPS

Made of tough, durable malleable iron . . . completely rustproofed. Full-width tongue between reinforced bolt lugs prevents pinching and damaging hose. Bolts are carefully machined and threaded for maximum ease of application.

Single bolt style, sizes ⅞" to 5¼"; double bolt style, sizes 3½" to 17¼".

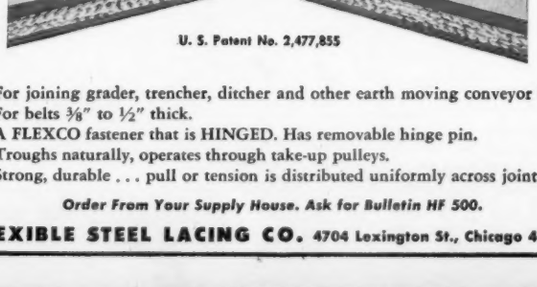
Double Bolt

Stocked by Manufacturers and Distributors of Industrial Rubber Products

DIXON Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO Associate Companies:

... the new separable

FLEXCO HINGED BELT FASTENERS

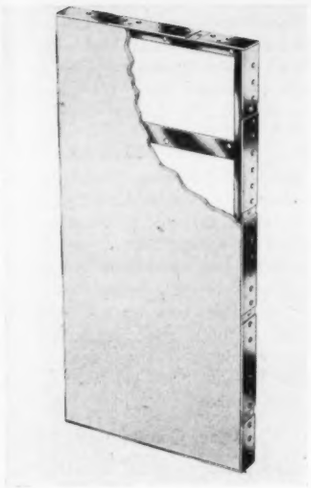


U. S. Patent No. 2,477,855

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts ⅜" to ½" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4704 Lexington St., Chicago 44, Ill.



The Uni-Form Panel.

Improved Form Panel

Improvements in the Uni-Form panel include a special rolled T-angle, with an equal-legged T-strut for additional structural rigidity in the portion of the frame which acts as a plywood protector. The added protection to corners and edges of the plywood increases the life of the plywood.

Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago, Ill., manufacturer, points out that the form panel combines the strength of steel forms while retaining the desired nailing surfaces of wood forms. Milled tie slots give tighter forming and minimize concrete seepage. Two-point contact of panel frames is said to give tight closure at the wall face.

For further information write to the company, or use the Request Card at page 18. Circle No. 364.

Manager for All-State

All-State Welding Alloys Co., Inc., White Plains, N. Y., has named Charles M. Norlin regional manager of Michigan, Indiana, and Illinois.

Mr. Norlin will be responsible for sales and service to users and distributors of All-State alloys and fluxes in his area. He will also be the contact man for the company's metallurgical resources and experimental laboratory.

Prior to his new appointment, he was a sales and service engineer for Detroit Electric Furnaces, a field engineer for Erico Products, and the founder of Y-dac Welding Supply Co.

Pour by Hand

TARCO #11

For Sheet Pouring bitumen in pavement construction and repair or waterproofing. Adjustable spout opening. Basket screen. All welded.

You'll often SAVE TIME when you pour by hand.

See your equipment dealer.

TARRANT MFG. CO.
Saratoga Springs New York

Transporting Mixer

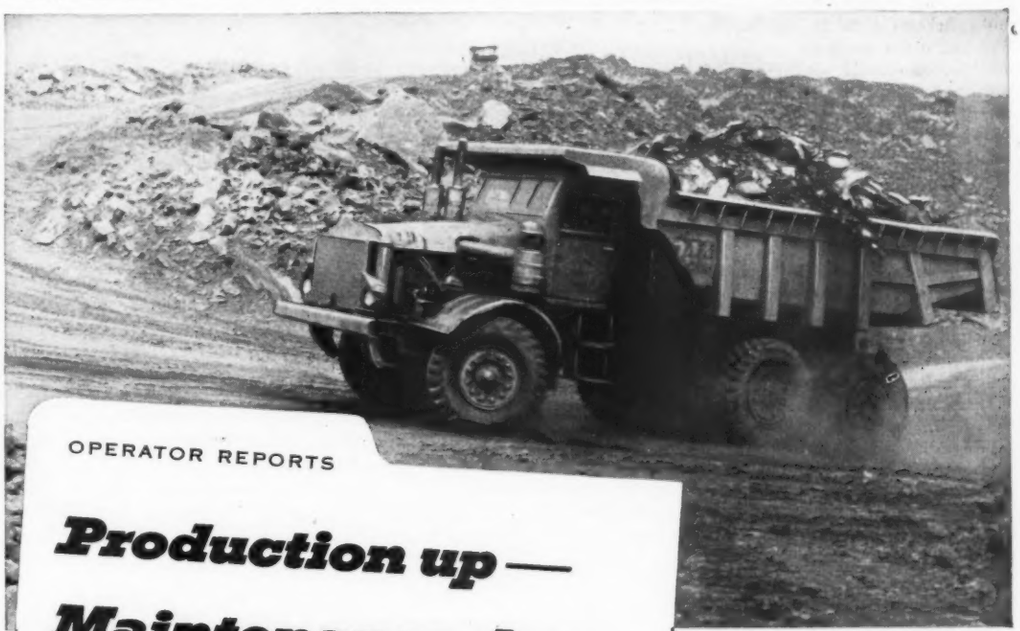
A transporting concrete mixer of 1-bag capacity that attaches to the rear of a Ford, Ferguson, Case VAC, or Allis-Chalmers WD tractor is shown in literature from Universal Pulleys Co., 330 N. Mosley, Wichita, Kans. The barrel is turned by friction from a power-takeoff extension to a standard 600 x 16 tire attached to the mixer barrel. The barrel in turn rolls in a dumping rack.

The mixing rack is attached to the hydraulic arms of the tractor. When the hydraulic mechanism is actuated, the hydraulic arms raise the rack and barrel to an almost straight up and down position to allow the mixture to flow out of the barrel.

The unit mixes or dumps while stationary or moving.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 448.

This trailer-mounted mechanical stone picker is made by Bridgeport Implement Works, Inc., 1483 Stratford Ave., Stratford, Conn. As the PixTone is pulled by a tractor, revolving teeth pick up stones from 1½ to 8 inches in diameter and throw them against a circular rake. A 3 to 6-hp gas engine powers the picking mechanism. For further information write to the company, or use the Request Card at page 18. Circle No. 472.



OPERATOR REPORTS

Production up — Maintenance down

Twenty of these Allison TORQMATIC-equipped trucks are working 21 hours a day hauling 34-ton pay loads of coal and overburden over 7½% grades.

The Wadesville Production Company operates 20 Allison TORQMATIC-equipped Euclid rear-dump trucks hauling 42,000 tons daily in its strip mine near St. Claire, Pa. These trucks boost production by making round trips 25% faster than the mechanical-drive units they replaced.

This operator's records show TORQMATIC DRIVES outlast mechanical drives — maintenance time and costs are down too. At routine overhaul periods, mechanics change out the TORQMATIC DRIVES in 2 hours less time than they change out a mechanical drive.

You, too, can cut your heavy-duty equipment operating costs by specifying Allison TORQMATIC DRIVES the next time you buy. Ask your equipment dealer, manufacturer or write:

ALLISON *Division of* GENERAL MOTORS
Box 894CC, Indianapolis 6, Indiana

ALLISON TORQMATIC DRIVES

Unbeatable Team for Maximum Operating Economy

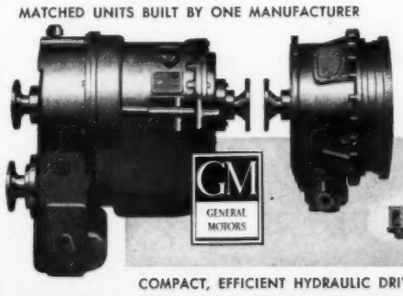
**Quick-shifts* at full throttle with fingertip hydraulic control.

**Holds* power to load at all times — no clutch pedal to push—no gearshift guess.

**Cuts* maintenance cost by absorbing shock—eliminates engine lugging—prolongs equipment life.

**Only* torque converter-transmission team designed to work as a unit and built by one manufacturer.

MATCHED UNITS BUILT BY ONE MANUFACTURER



Allison TORQMATIC DRIVES

COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES * TRUCKS * TRACTORS * SHOVELS * SCRAPERS * DRILLING RIGS

200,000-Ton Steel Plant For Western Kentucky

Green River Steel Co. Constructs 4-Unit Plant On 127-Acre Site

• ANNUAL steel ingot production of 200,000 tons will soon be coming from the plant of the Green River Steel Corp., constructed at Owensboro, Ky., which was scheduled to start production in June, 1953. This is the first steel plant in western Kentucky.

Barge, railroad, and highway transportation is equally available at the 127-acre level flood-proof site, 3 miles east of Owensboro, where the Ohio forms the northeast boundary, and the Louisville and Nashville railroad the southeast line with U. S. 60 (main highway between Owensboro and Louisville, Ky.) cutting across one corner.

Buildings

Designed for functional straight-line flow of raw materials and finished products, the main plant buildings consist of 4 units which form a right angle "L". Standard mill construction consists of structural steel framing, roof trusses, and galvanized siding and roofing.

Three of the buildings form the base of the "L" and are utilized for melting furnaces, pouring and teeming, and ingot heating and processing.

The first two are bays, each 80 feet wide with the furnace unit 175 feet long and the pouring and teeming building 250 feet long. Clear height of 57 feet to the lower chord of the trusses provides ample clearance for crane operation. The enclosed area for the two units adds up to 34,000 square feet.

The exterior bay forms the charging floor side of the top-charged electric furnaces which have 17-foot shell diameters, 50-ton-rated capacities, and maximum power capacities of 18,000 kva. Storage bins for limestone and fluxing materials are also located in this bay and a 200-foot open extension forms the scrap yard. The interior of the bay has facilities for tapping the furnaces, and teeming and stripping the ingots.

A single bay, 80 feet wide and 210 feet long with the same ceiling clearance, provides space for ingot heating and processing. Eight soaking pits have combination oil and gas-heating units. Hot ingots are transferred from the pits to the 2,500 and 1,500-ton forging presses of the Dornin Process.

The rolling mill is an 80-foot bay, 835 feet long with a 40 x 455-foot extension housing a shop, change area, and motor controls. Clear height to roof trusses in this section is 42 feet. Major mill equipment consists of three stands with 24 x 60-inch rolls powered with 2,100 and 1,250-hp reversing electric motors. These mills will produce blooms 6 to 12 inches, billets 2 to 6 inches, rounds from 2¼ to 8⅝ inches, and a variety of flats, angles, and special sections.

Construction

While building construction followed standard mill practices, foundations for the heavy equipment created some special problems.

For instance, one of the heaviest demands on substructures was imposed by the rolling mill which was purchased used and moved to the site. Since no plans or designed data were available with the mill, foundations had to be laid out after arrival and while the mill was being remodeled and modified for its new job.

Unstable soil with a tendency to cave interfered with foundation and footing excavations and required cofferdams of steel sheet piling. Interiors were clammed out with a 2½-yard Lorain crawler and truck-mounted cranes which were also used in the steel erection. Excavation and site clearing was done with dragline and bulldozers.

Foundations and piers were set on piling and the Raymond Pile Co., New York, N. Y., drove 6,700 linear feet of Step-Taper cast-in-place piles mostly in clusters to 65 feet with a permissible loading up to 75 tons per pile. Raymond used one of its crawler-mounted rigs carrying a 90-foot set of leads and a 75-hp steam boiler. Hammer was a single-action Vulcan, built to Raymond specifications.

Forming

Concrete forms were built on the job using conventional 2 x 4 studs on 16-inch centers and plywood facing, and 2 x 6 wales. Forms for center cores for pits were single construction with angled corners.

Transit-mix concrete was used for piles, footings, and foundations in two strengths—28-day design for 2,500 psi and 3,000 psi from 5 and 5½-bag mixes.

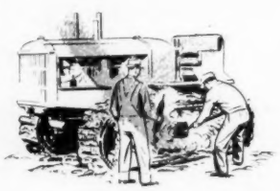
Other Construction

Considerably more construction was required to complete the supply facilities for the plant. Six wells were drilled on the site producing

Advance design features make Allis-Chalmers Tractors performance leaders

It takes truly modern equipment to keep pace with today's stepped-up demands — and do it at an operating cost which insures fair and consistent profits. The line of Allis-Chalmers crawler tractors has been designed and built completely new since the war, with the kind of advanced engineering that delivers big-capacity performance at a minimum of maintenance expense.

This forward progress is a continuing program. Additional improvements are constantly being incorporated into the HD-5, HD-9, HD-15 and HD-20 tractors. If you are in the market or just interested, see your Allis-Chalmers dealer for all the inside facts that have proved so popular with owners as well as operators and mechanics.



Daily Lubrication

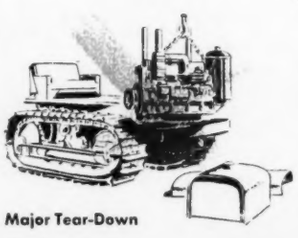
1000-hour Lubrication

On all Allis-Chalmers tractors, you can operate six months on a 40-hour week basis with just one lubrication of truck wheels, front idlers and support rollers. Designed with positive seals and tapered roller bearings, these units are protected from dust, loose sand, soft ground, mud or water. You not only gain working time, but save labor and lubricant costs as well. And there's no costly damage from greasing neglect.

Ordinary Steering Clutches

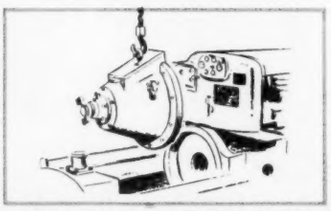
Hydraulic Steering and Self-Energizing Brakes

Allis-Chalmers HD-15 and HD-20 tractors are equipped with fingertip hydraulic booster steering — operator exerts only 3 to 5 lb. pressure on the controls. As a result he gets small tractor maneuverability from these 27,850 and 41,000-lb. crawlers and can concentrate on his work. All four models are equipped with self-energizing brakes. These require less pedal pressure and take hold with a firm, uniform grip for accurate control.



Major Tear-Down

Unit Servicing



No need to remove transmission or engine, radiator, grille, etc., when servicing or removing an Allis-Chalmers master clutch. The unit assembly principle also applies to final drive gear, transmission, steering clutches, engine and truck frame. As a result, hours of costly service and down time are saved because of Allis-Chalmers advanced design.

700 gpm each. Western Kentucky Gas Co. is furnishing natural gas through the facilities of Texas Gas Transmission Co. Kentucky Utilities built a new 33-mile electric line from its Green River Station at South Carrolton, Ky., to supply the needed 138 kv. An emergency tie-in was constructed with Municipal Utilities at Owensboro which is adding to its generating capacity.

General offices for the steel company were housed in a remodeled 2-story brick residence which existed on the site.

Quantities and Personnel

The construction job included the following quantities:

Item	Quantity
Excavation	50,000 cu. yds.
Sheet steel piling	15,000 lin. ft.
Cast-in-place piling	6,700 lin. ft.
Reinforcing steel	500 tons
Structural steel	2,500 tons

Sidney D. Williams, president of Green River Steel Corp., did the planning and preliminary engineering; he was assisted by Warren Worthington and Thomas W. Hardy, Jr., consulting engineers, and George A. Dornin, Jr., son of the developer of the Dornin Process. Green River Steel Corp. was represented on the construction by Williams; Charles F. Hammond, general superintendent; and John E. Wolf, chief engineer.

Detailed engineering and plant design was performed by Ebasco Services, Inc., New York, N. Y., under the supervision of Frank G. Jennings, project engineer, and E. P. Wilson, construction superintendent. Globe Erection Co., Louisville, was the general contractor, with T. S. Moore, superintendent.

Other contractors were: Lombard Corp., concrete foundations; Voigt-Conant, steel erection; O. L. Depp, grading; Raymond Concrete Pile Co., cast-in-place piles.

The interior of the mill building which houses a shop, change area, and motor controls. Mill equipment includes three stands with 24 x 60-inch rolls, powered by 2,100, and 1,250-hp reversing electric motors.

Asphaltic Coating With Mica Filler

An asphaltic emulsion with a mica filler is recommended by the manufacturer as a protective coating on smooth surface asphalt roofs and metal surfaces.

Laykold Fibrecoat, made by American Bitumuls & Asphalt Co., 200 Bush St., San Francisco, Calif., can be applied cold by brush, squeegee, or spray equipment. It is available in red, green, or black.

The compound is said to stop moisture penetration and to withstand weathering and oxidizing conditions. The mineral flakes in the asphalt coating overlap like very small slate shingles protecting the coating and the surface beneath. Mineral fibres interlace the mineral flakes and asphalt, binding them into a bituminous coating.

In addition to asphalt and metal, the coating has also been used on concrete, brick, stucco, and on all types of surfaces which provide a sound base (except wood), the manufacturer states.

Application of one or two coats retards oxidation and corrosion on bridge steel and concrete, gasholders, penstocks, pumps, sheet piling, exposed pipes, boilers, tanks, and galvanized buildings. The emulsion is compatible with red lead and zinc chromate-type primers used on metal surfaces.

For further information write to the company, or use the Request Card at page 18. Circle No. 369.

Salt-Stabilized Roads

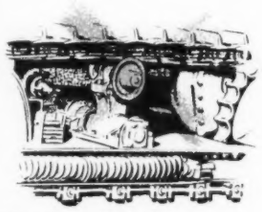
A new booklet tells how a salt-stabilized gravel road is made by mixing salt with the aggregate, wetting it, rolling it, and letting it dry.

Advantages of stabilization with salt include, according to the text, less dust, practically no frost boiling, and a minimum loss of aggregate. It is pointed out, furthermore, that salt is economical, easy to use, and always available.

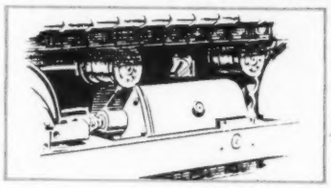
In addition to its primary use as a stabilizing agent for secondary roads, salt is also used for base course, primary roads, alleys, parking areas, airports, driveways, outdoor theatres, and school yards.

To obtain this literature write to the Morton Salt Co., 120 S. LaSalle St., Chicago 2, Ill., or use the Request Card at page 18. Circle No. 390.

Oil Enclosed Track Release Mechanism



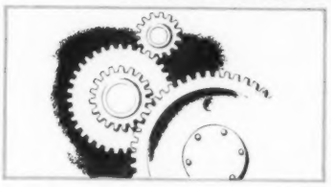
Open or Partly Shielded Track Release Mechanism



Operating in oil and *sealed* against dirt and moisture, the Allis-Chalmers track release mechanism seals out mud, ice and debris. Because it's completely sealed, the release mechanism is in working condition at all times — providing positive protection when obstacles jam into the tracks.

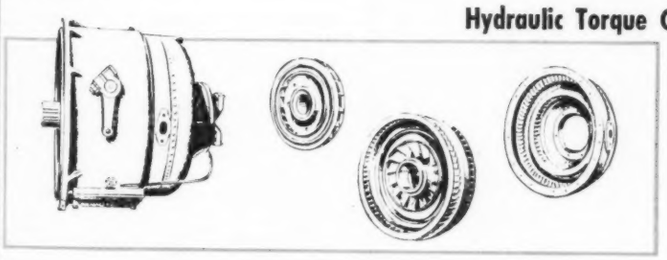
Double Reduction Final Drive

Single Reduction Final Drive



With smaller gears and shorter shafts, double reduction final drives provide better bearing and gear alignment. The "live" axle permits smaller, more serviceable seals. Equally important, double reduction drive provides for smooth, clean bottom construction and the extra ground clearance so necessary on rough terrain.

Hydraulic Torque Converter Drive



The Allis-Chalmers HD-20 is the only crawler tractor in the industry where torque converter is standard equipment and part of the tractor's basic design. With torque converter there is greater pay load capacity because this unit automatically balances travel speed to the load — no idle horsepower, no worry about engine stalling. And with most shifting eliminated, there's far less operator fatigue.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

Front-End Loader

A hydraulic front-end loader for wheel tractors is shown in literature from Ulrich Products Corp., Roanoke, Ill. A feature of the loader is that the bucket returns to loading position automatically after dumping.

The literature also shows the loader converted to a lifting boom by the removal of two bolts. With the bucket and side rails removed the unit becomes a post puller.

The Domor loader may be obtained with a bulldozer and snowplow-blade attachment.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 461.

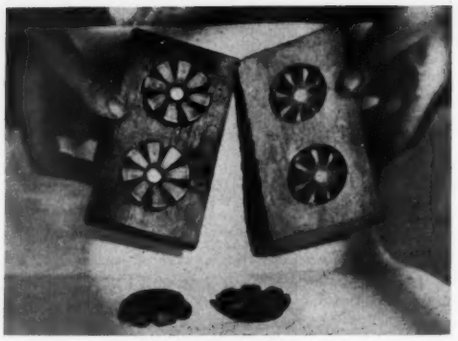
"BERG" Concrete Surfacer

A light-weight, portable, electric motor-driven Concrete Surfacer consisting of the Model R2 Right Angle Head and Model AS Motor Unit.

Ideal for surfacing concrete buildings, bridges, dams, walls and many other applications.

Quickly converted into the Model V2-AS Concrete Vibrator for Internal vibration by substituting the Model V2 Vibrator Unit for the above Head.

The Concrete Surfacing Machinery Co.
4665-4669 Spring Grove Avenue Cincinnati 32, Ohio



Undercut niches in concrete by rubber disks become anchor holes for binding plaster to concrete.

Niches in Concrete Bond Plaster Directly

A method of bonding plaster to concrete by preforming 2-inch niches in the concrete is announced by Buffalo Products, Inc., P. O. Box 48, Murray Hill Station, New York 16, N. Y.

A pattern of the spokelike holes serves as a multiple anchorage for plaster which squeezes into the niches and hardens to form a permanent, lathless, mechanical bond. Wood lath, metal lath, or roughening are not required.

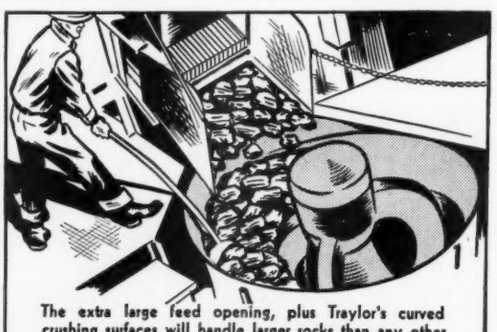
The holes are produced by little rubber disks called Kifs and manufactured by the company. These are nailed to form boards. When the forms are dismantled, the flexible rubber disks remain attached to the boards and pull out of the concrete to leave undercut niches.

The bonding method may be used on walls, ceilings, arches, vaults, and on all sides of beam and column forms, and is recommended where ceramic tile will be attached directly to the concrete.

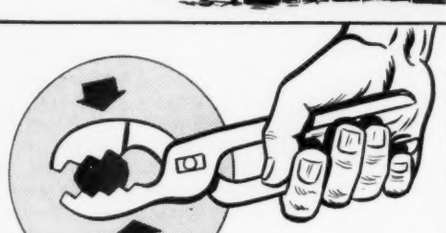
Special types of disks are available for anchoring brickwork, marble, slate, and terra cotta to concrete walls and spandrels.

For further information write to the company, or use the Request Card at page 18. Circle No. 381.

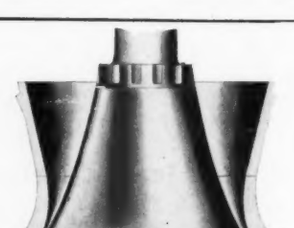
Traylor TY Reduction Crusher Swallows Big Rock with less Choking



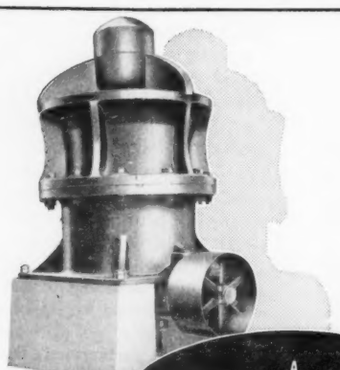
The extra large feed opening, plus Traylor's curved crushing surfaces will handle larger rocks than any other secondary crushers. This means a smaller percentage of oversize need be returned for a second pass thru the primary breaker.



Traylor's Curved Crushing Surfaces apply power as a direct crushing force . . . assure a more uniform cubical aggregate on less power per ton. This efficient use of power also reduces wear and replacement costs.



Curved Crushing Surfaces also reduce lifting and churning . . . choking and packing. Each zone in the crushing chamber has greater capacity than the preceding zone . . . aggregate has free fall through the all-around bottom discharge.



A Traylor LEADS TO GREATER PROFITS

INVESTIGATE all the advantages of this compact and efficient secondary crusher. Free bulletin gives complete illustrations and specifications, including size and capacity range, of the Traylor TY Reduction Crusher. Send coupon for your copy today.

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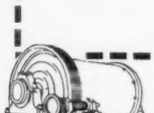
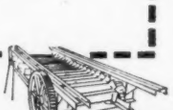


Ball Mills

Jaw Crushers



Apron Feeders

Vegetative-Cover Project

The New York State Department of Public Works, with the cooperation of Cornell University, Rutgers University, and a group of outstanding authorities in matters relating to soils and turf, has published the report on a research project conducted during the fiscal year of 1951 to 1952.

"Roadside Vegetative Cover Research Project" summarizes experiences gained throughout the northeastern states since 1940, which are applicable to roadside conditions. The report presents the opinion that great economies can be effected in the methods of establishing turf during the construction of highways. Further research devoted to details of its establishment and maintenance is expected.

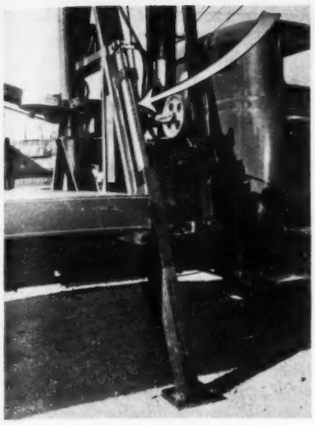
The text is accompanied by illustrations, tables, and followed by a typical progress report and an analysis chart.

The pamphlet is available from the Landscape Bureau, New York State Department of Public Works, Babylon, N. Y.

Wire-Rope Sling Data

A new folder describes the SW-55 wire-rope sling made by the Wire Rope Sling Department, American Chain & Cable Co., Inc., Bridgeport 2, Conn. The literature shows the type of lift that the sling will handle efficiently. It gives complete specifications, dimensions, and recommended uses.

To obtain Folder DH-421 write to the company, or use the Request Card at page 18. Circle No. 403.



The Hydra-Lift with outriggers.

Outriggers Added to Truck-Mounted Crane

Hydraulically operated outriggers are now available as optional equipment on the truck-mounted crane made by Pitman Mfg. Co., 300 W. 79th Terrace, Kansas City 14, Mo. The crane on the Model B Hydra-Lift has a load line capacity of 6,400 pounds and a swinging boom which telescopes from 12 to 22 feet. The boom swings 180 degrees and lifts through an arc of 100 degrees.

The operator raises and lowers the outrigger legs by manipulating controls at his regular station. The manufacturer points out that this speeds up any job where outriggers must be used frequently, such as stringing pipe, pulling paving forms, and unloading materials.

The truck crane takes up about 40 inches behind the cab of the truck leaving the balance of the chassis for hauling purposes.

A safety feature of the outriggers is that operators do not try to get by on border-line loads without first putting outriggers down, since they are controlled from the cab.

A further use of the outriggers is that if the truck on which the crane is mounted is on uneven ground, the operator can use them to level the truck before picking up a load.

For further information write to the company, or use the Request Card at page 18. Circle No. 434.

Hydraulic Transmissions

New literature that explains the basic facts of the hydraulic transmission of power is available from Twin Disc Clutch Co., Racine, Wis. One booklet takes up the difference between a hydraulic coupling and a hydraulic converter, and explains how and why couplings transmit torque and converters multiply it.

A second booklet discusses torque converters for trucks. It has cutaway views of a direct-drive and a clutch-type model. A section lists the factors to be considered in choosing a hydraulic torque converter for a truck. There are also charts of truck performance for each model.

A third booklet explains what a torque converter is, and what it can do for an engine. Charts and text detail what a torque converter will do to the performance of a crawler tractor, a hoist, a truck, an excavator, or a slush pump.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 451.

Pennsylvania Road Map

A map in four colors, showing many of the major highway relocations and new multiple-lane roadways in Pennsylvania, is being distributed free for the use of motorists by the Pennsylvania Department of Highways. Distribution is through motor clubs, tourist agencies, State Police stations, and the Pennsylvania Department of Highways.

New constructions of interest that are shown on the map include: the 3 and 4-lane widening on the William Penn and Lincoln Highways, and Routes 6 and 611 in the Scranton area; the M. Harvey Taylor bridge at Harrisburg; the Harrisburg-York Expressway, parts of which are still under construction; the Memorial Bridge south of Wilmington; a section of the New Jersey Turnpike; and the projected Ohio Turnpike. Completed or projected by-passes around cities are included on the face of the map and on the reverse side, which contains large-scale drawings of 35 Pennsylvania cities and a key to all principle towns. Major construction projects scheduled for completion during the current season are marked in small blocks, and the Pennsylvania Turnpike is shown with all interchanges and the proposed extension to the Delaware River crossing. Other important data are included.

The Extra trailer for Extra production

MILLER Tilt-Top CUTS job-to-job time for slow machines

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Where large flat bed trailers are usually too cumbersome for lighter haul'ng . . . a MILLER Tilt-Top is always handy for moving slow machines from one operation to another. Self-moving equipment practically loads itself onto tilted platform and can be towed to the next operation in jig time . . . cutting non-productive time for operator and equipment to a minimum. Standard platform is 14' x 8', optional 16' available.

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The following equipment is optional and extra: hydraulic tilt control, two-speed winch, electric brakes.

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Equipment of The Campanella and Cardi Co. at work near Barnstable, Mass.

Off-the-road tires haul 35 tons over soft roads, up 15% grades

THE Mid-Cape Highway, pictured under construction, runs from the lower end of Cape Cod to Provincetown, Mass. To build a 4½-mile stretch, 928,000 cubic yards of earth, at 2,900 pounds per cubic yard, had to be moved 4,665 feet from shovel to fill area.

The truck above weighs 15 tons. That's 35 tons, with payload, for those tires to carry over rough construction roads, up steep 15% grades. The tires can take this rugged work 9 hours a day, 6 days a week, because they are B. F. Goodrich Universals. Husky, wedge-shaped cleats resist rock cuts and bruises, give positive traction in either direction.

B. F. Goodrich Universals are built with the exclusive nylon shock shield. Layers of strong, elastic nylon cords under the tread stretch together under impact to protect the tire from shocks and bruises. Result: B. F. Goodrich tires give more mileage, more recappable tires and more miles per recap, increased bruise resistance and less danger of tread separation.

The patented nylon shock shield gives all these money-saving advantages, yet it costs nothing extra. *Double* shock shield in sizes 12.00 and larger.

There's a complete line of BFG tires that offers bonus hours of service and reduced costs on all types of off-the-road work. See your B. F. Goodrich retailer—he's listed under Tires in the Yellow Pages of your phone book.

Specify B. F. Goodrich tires when ordering new equipment

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Low Saturated Topography, Criss-Crossed by Highways Loaded With Heavy Traffic, Creates Upkeep Headache

Maintenance Battle On Substandard Highways

• THE engineering professor who said, "Drainage is the most important thing in highway building," must have coined his famous saying after a visit to District 03 of the Louisiana Department of Highways at Lafayette, La.

There may be subgrade conditions as formidable elsewhere, but there are certainly none to top those of the Lafayette District. Situated in low, saturated, muggy, poorly-drained country covering six parishes along the Gulf of Mexico, most of the surfaces are supported largely by imagination. But it takes little imagination to know what's going on underneath those surfaces if one gets behind an oilfield truck loaded with a pump and part of a derrick. As the wheels of that heavily loaded truck move down a dry highway, muddy water all too often squirts up from longitudinal and transverse joints. If an observer looks closely, he can often see pavement ruptures occur before his eyes.

Meanwhile, this kind of traffic is increasing. Lafayette is situated on U. S. 90, presently the main route between Houston, Texas, and New Orleans, La. Nowhere is the maintenance battle typified in better fashion. District 03 has a more or less permanent force of 500 men and a host of power equipment thrown into the fight to save a 1,400-mile highway system. The fight is such a touch and go affair that it would probably be inaccurate to say the maintenance crews are winning. If automobile traffic and heavy truck loads continue to increase, a point of diminishing economic returns may be reached where it will be cheaper to build a new highway system than to maintain the old.

If blame for such a situation can be placed, it can be charged to no individual. Rather, it's the old story of too-rapid development of the Automobile Age—of a nation on wheels whose rolling stock developed faster than the roads to accommodate those

Powered by a Jaeger 105-cfm compressor, this Thor gun in the hands of a maintenance laborer drills holes to take the slurry which will be pumped under the pavement.
Ray Day Photo

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MEDIUM UTILITY DITCHER
...for Greatest Dollar Value!

Buckeye's brand new model 303 is the outstanding wheel-type ditcher for its size and capacity developed in 60 years of Buckeye experience! . . . Low in first cost and easy to maintain it has been "contractor proven" in a wide variety of soils and climates . . . Digs to 5 ft. depths in 10, 12, 14, 16, 18 and 20 in. cutting widths at digging speeds up to 18 f.p.m. . . . Cuts the right size ditch for most applications in city, county and utility work and is ruggedly built to withstand the many abuses usually encountered . . . Small and compact with low ground bearing pressure . . . Positive depth control in hilly and rough terrain . . . Your dealer has complete details and —

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BUCKEYE LADDER-TYPE DITCHERS

Give you cutting widths of from 8" to 48" with boom lengths up to 16 ft. for all types of utility work. No matter what machine suits your job—Buckeye makes it!

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vehicles. Roads built to accommodate automobile traffic in this never-too-favorable terrain simply cannot sustain present heavy loads. The pumping joints speak an eloquent sermon on that general theme.

Fight Goes Forward

Nevertheless, a constant battle is being waged by the Lafayette District, under supervision of J. E. Jarman, district engineer, and E. E. Guillot, district maintenance engineer. Neither Jarman nor Guillot considers that battle in any sense a losing fight. As the failures occur in their highway system, they simply program a flow of materials, equipment, and manpower to throw into the breach.

District 03 includes the parishes of Cameron, Iberia, Lafayette, St. Landry, St. Martin, St. Mary, and Vermilion, La. In those six land areas a total of 300.13 miles of portland-cement concrete, 220.05 miles of asphalt of various types, and 921.88 miles of gravel roads exist.

This land consists largely of farming country, swamps, or grazing land. Lafayette, a city of about 35,000, is one of the biggest towns. The soil is deep, rich, and loaded with organic matter as good for farming as it is bad for highway construction. No native shell beds or sources of crushed rock or gravel are available to District forces except on a straight purchase basis from commercial producers of those materials. It may shock many a maintenance engineer in desert regions, who takes nearby gravel pits for granted, to know that every cubic yard of gravel or crushed rock costs from $4.50 to $5.00 delivered in this District. Oyster and clam shell may run to $3.30 per cubic yard.

These prohibitive costs, more than anything else, caused many of the original all-weather roads to be built without adequate base support. Today, because the bases weren't constructed, surfaces are deteriorating rapidly.

Organizationally, the District uses a gang maintenance system operating under the general supervision of the district maintenance engineer. While a higher than normal labor turnover exists in the labor ranks of the various crews, all men on the engineering supervisory staff are experienced veterans with many years of continuous experience. Jarman, for example, is a 31-year man with the Louisiana Department of Highways. Guillot, the district maintenance engineer, is a 29-year man. Correlation of the various gang activities comes under their supervision.

Permanent suboffices for maintenance have been established at Opelousas, New Iberia, and Abbeville, La. Plots of ground 12 acres in size have been purchased at these locations for the storage of equipment and materials, and tin headquarters buildings about 60 x 120 feet in size have been built. As far as possible, maintenance gangs are assigned to these suboffices, although some do District-wide work.

A gravel foreman in each parish covers his entire territory with the responsibility of directing motor-grader maintenance of gravel roads, arranging for and purchasing gravel to replace the approximate ½-inch which wears away each year, and directing the replacement of this material. Motor graders, operators, loaders, trucks, and so on are a part of this man's equipment.

There are experienced concrete and asphalt crews who specialize in the maintenance and repair of those types of pavement. As a rule their work is District-wide, although a crew might well be based near a suboffice for some time.

Motor-grader crews are what their designation implies. They usually work under the direction of the

(Continued on next page)

A Mud-Jack crew, protected by a flagman, works with a Koehring Mud-Jack machine to inject the asphalt-emulsion slurry at high pressure. *Ray Day Photo*

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WHEEL-TYPE UTILITY DITCHER

...for both city and country jobs!

The Buckeye model 306 is fully capable of day after day operation on pipeline jobs yet handles heavy work in confined city areas equally well . . . Digs to 5'6" depths in 12", 14", 16", 18", 20", 22" and 24" widths at speeds up to 21 f.p.m. Exactly the right size for small water, gas and sewage mains; electric and telephone cable and conduit; foundation footings, highway drainage and service lines . . . Only 8 ft. wide with a ground bearing pressure less than that of the average foot-step! Easy to load on trailer for fast transportation. Pipeline operators find it ideal for digging gathering lines, short loops, product lines, etc. . . . Built to Buckeye's exacting standards of dependability . . . Always remember that—

Only Buckeye has a Ditcher for every Ditching Job!

BUCKEYE '160' SERVICE DITCHER

A big, ladder-type ditcher that digs to full 16 ft. depth in 14 widths ranging from 13" to 48". Easily handles the big pipe and sewer jobs yet can turn in its own length.

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Contact your equipment dealer or write direct.

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Maintenance Battle On Substandard Highways

(Continued from preceding page)

gravel foreman in their respective parishes. There are three specialized truck fleets which move around all over the District to haul materials, build up grades, and perform miscellaneous hauling. These crews generally use ¾-yard Michigan, Lorain, or other motor cranes rather than crawler equipment for loading the material.

Other gangs include an asphalt-reconstruction crew, a District-wide outfit which half-soles, rebuilds, and seals asphalt pavements. There is a bridge-reconstruction crew and a bridge-maintenance gang. These, too, are District-wide outfits.

Equipment for these various outfits is managed through an Equipment Division in the Highway Department, and each unit is rented for a reasonable charge. In fact, the principal accounting items of the maintenance section include equipment rental, labor, and materials costs. The total average annual budget for routine maintenance of the 1,458-mile system is $1,250,000.

An Allis-Chalmers mower works along U. S. 90, performing the first six cuttings it will make along the highway this year. *Ray Day Photo*

Portland-Cement Concrete Upkeep

The maintenance of portland-cement concrete under adverse loading conditions and bad drainage has, with increasingly heavier traffic, become the No. 1 maintenance problem in the District. So far, the ultimate answer to failing portland-cement concrete pavement is its widening with asphaltic concrete or portland-cement concrete, and a general resurfacing with asphaltic concrete. Sections treated in this way, usually under contract construction, incidentally, have stood up satisfactorily for the short time most of them have been in. What will happen in the near future, especially where no adequate bases exist, is anybody's guess.

Any overlay job is preceded by Maintenance Department work which is rather general, so far as concrete pavement is concerned. Maintenance work on portland-cement concrete usually begins when surface cracks begin to develop between the expansion and contraction joints. These cracks are filled with hot asphalt, or more recently, with an EA-4 asphalt emulsion, to prevent the infiltration of moisture from rains. As the expansion and contraction joints open up, these openings are also filled, usually with the same joint-filler material which was used when the road was built.

When concrete roads begin to rock and pump under heavy traffic, and slabs begin to break up, a concrete-patching crew often moves in with small mixers and other portable equipment. If a section is bad enough to require patching, the old concrete is jackhammered out and new material is poured. The base is also repaired at this time. Many such patches are always necessary when a concrete road has broken up enough to require resurfacing.

Pumping joints, which have moved enough to develop voids beneath the pavement, are being treated with a special type of asphalt undersealing or Mud Jacking. An especially effective method of undersealing which seems to be holding up has been developed, with a formula calling for 4 cubic yards of silty loam soil, 5 sacks of portland cement, 200 gallons of EA-4 asphalt emulsion, and enough water to make a mortar-like slurry. This material is mixed up in the pugmill of a Koehring Mud-Jack machine, and injected underneath the slab under high pressure through holes jackhammered into the pavement along joints and cracks. The emulsified asphalt in the mix seems to promote a rapid setting up of the material, and excellent results have been noted even under adverse base conditions where this has been done. Mud-Jacking is initially done in the spring, when pumping joints are much in evidence, and continued until the annual program for that type of maintenance is finished for the season.

Conventional barricades, warning signs, and flagmen protect maintenance crews engaged in these operations.

Asphalt Maintenance

Maintenance of asphalt highways,

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Atlas conveyors will do the job faster... safer... and at lower maintenance cost for you.

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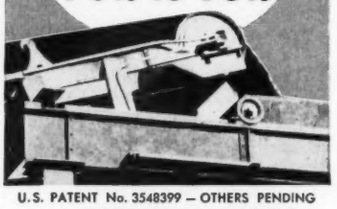

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- No chains, sprockets, sheaves, out in the weather and dirt!
- No chain idlers to keep adjusted or oiled!
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- No shafts and drives to service and lubricate!
- No motors exposed to damage or weather!

Everything CONTAINED within the pulley!

IT'S *motorized* to eliminate expensive upkeep and cut downtime to the barest minimum on all belt conveyor or belt-bucket elevator operations. *All moving parts are inside the pulley,* enclosed and protected by the pulley shell from weather, dirt and damage. Operation is simple... the pulley shell rotates around the electric motor and reduction gears, which are held stationary by a torque arm attached to conveyor frame. Compact, easy to install, *economical* ... get complete details from your nearest distributor, or write for Bulletin MP-1 today!

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Perfect Balance!

Sterling Wheelbarrows move quickly and easily because of their perfectly balanced construction. Actually 80% of the load is on the wheel . . . only 20% on the operator. That certainly lightens the load for fast, easy wheeling.

Wood handles are longer, formed to fit the operator's hands. Steel channel legs and reinforcements are designed for maximum leg clearance. Write for new Wheelbarrow Catalog No. 63A.

STERLING D3½W
(above) Sturdy wood-handle barrow for dry materials. 3½ cu. ft. capacity.

STERLING C5W
(right) Ideal for concrete, mortar, etc. 5 cu. ft. capacity.

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Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

too, is a problem. There are several types of asphalt surfaces in the District, which range from ordinary surface-penetration treatments to high-type asphaltic concrete placed by the plant-mix method. Asphalt highways are usually on bases consisting of gravel, shell, or stabilized subgrade material. There is a considerable number of miles of stabilized base consisting of both soil-cement and soil-asphalt.

Asphalt highways are maintained by patching holes with cold-mixed material, by upper decking with half-sole courses of cold-mix, or in some cases with hot-mix, and by seal-coating. Because of the damp climate and high precipitation, it is vital that asphalt roads especially be maintained in as nearly a water-tight condition as possible. In recent years, some excellent sealing results have been attained by using EA-4 asphalt emulsion in connection with surface chips ⅝-inch-minus in size. The emulsion seems to stick well to the pavement surface as well as to the new chips.

Asphalt distortion is usually treated by ripping up the failing section, repairing the base if necessary, and relaying the old material with additional mineral filler. These repair jobs are then seal-coated to complete the repair. Regular inspections by Guillot or by his resident maintenance engineers at Abbeville, Opelousas, and New Iberia locate asphalt sections in need of repair or replacement.

Once-a-Week Gravel Maintenance

Gravel-road maintenance is set up for once-a-week intervals, and in all but exceptional cases each mile is bladed at these intervals. Blading is done to pull loose particles back to the roadway, and to mix these loose particles with binder material. In addition to such maintenance, about ½ inch of gravel per year is replaced as a part of the maintenance operation.

Motor graders usually work in pairs, with a power machine working along towing a tail grader. One pass of this combination will blade half the width of the road. A second pass will finish the operation. Mileage is usually set up on the basis of about 65 miles for each pair of machines.

Other Work Done, Too

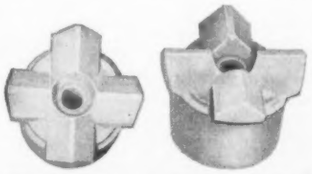
Considerable maintenance work is done along other lines, too. Mowing, for example, is a terrific assignment. So rich is the soil and so plentiful the precipitation that grass and weeds grow at amazing rates. Six or more mowings a year are not at all uncommon. The mowing gang is a part of a handyman crew which, from April 1 to October 31, mows continuously. During the winter and early spring months, these men work with concrete repair crews.

Working with a Littleford kettle and heater, an asphalt crew starts the day's operations by melting asphalt out of drums for undersealing. *Ray Day Photo*

In February, the bridge-repair gang had a real workout when a passing barge knocked an entire bridge span off its pier on a bayou crossing near Abbeville. Traffic was detoured around the site over existing state highways. The bridge-repair gang brought in a floating pile driver and drove a sturdy set of dolphins near the end of the span which was down. When this was done, they rigged up a heavy set of blocks and lifted the span up out of the mud until it was approximately level. The span was then jacked up and moved into its original position. The bayou crossing was out only about six weeks.

One thing maintenance men do not do is to go off the state highway system to do favors for nearby landowners. The penalty for that is im-

(Concluded on next page)



Throwaway Rock Bits

Have been proven:

1. Low in original cost
2. Lower in cost per foot of hole
3. Longer lasting
4. Easy to use
5. Economical for all type Jack Hammers

⅞" Socket in 9 sizes, 1¼" to 1¾"
1" Socket in 9 sizes, 1" to 2¼"

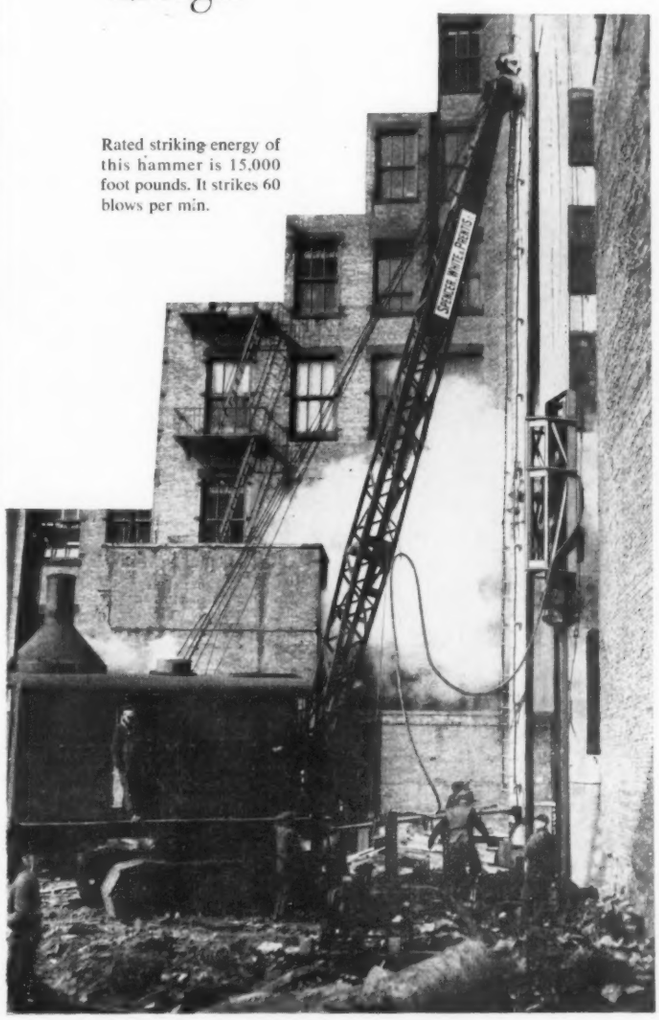
CONVENTIONAL ROCK BITS GIVE WAY TO IMPROVED MODERN DESIGN

Write for prices and full details

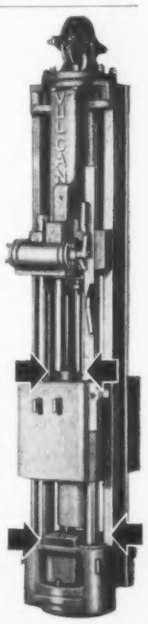
THROWAWAY BIT CORPORATION

4200 N. W. Yeon Ave., Portland 10, Ore.

"U.S." cushions a pile hammer ...using a 53-year-old design



Rated striking energy of this hammer is 15,000 foot pounds. It strikes 60 blows per min.



Arrows indicate the "U. S." rubber bumpers. Despite the terrific series of impacts, they retain their natural resilience.

This pile hammer is equipped with 2 "U. S." rubber bumpers at the top of the ram, and 2 at the base. It's their job to absorb the smashing over-drive of the hammer and prolong the life of the equipment. But the main point is that for the last *53 years these bumpers have been built according to the same blueprint*. So perfect was the design that the makers of the hammer have never required any change.

This is an example of the quality built into every United States Rubber Company product. "U. S." engineers stand ready to work with you in the improvement of any product. Consult them at any of our 25 District Sales Offices. Or write to address below.

Another "U. S." leader that has rolled up enviable records for long service is Matchless® High Pressure Steam and Pile Driver Hose. It is burst-proof, for the protection of the worker.

U.S. RUBBER — SERVING THROUGH SCIENCE

"U. S." Research perfects it..."U. S." Production builds it...U. S. Industry depends on it.

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes
Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

The Bazooka, a portable trailer-type inclined-screw conveyor, transfers cement from a low truck to a Wood cement tanker. The conveyor is powered by a gasoline engine. For further information write to Wood Mfg. Co., P. O. Box 620, 6900 Tujunga Ave., North Hollywood, Calif., or use the Request Card at page 18. Circle No. 454.

Maintenance Battle On Substandard Highways

(Continued from preceding page)

mediate suspension. By emphasizing the enforcement of this rule, maintenance men are showing their crews the importance of keeping the state highways passable. Like a U. S. Marine on duty, a District 03 motorgrader operator on duty has no friends.

New construction jobs now going in are being built to higher standards than in the past, within the limits of available funds. As these new sections go in and come under maintenance, they are being watched with ever-increasing attention so that maintenance can start in such a way as to prevent rapid deterioration. Meanwhile, on the older sections, routine patchwork, Mud-Jacking, seal-coating and all the other measures which have become standard are being programmed to keep pace with whatever damage takes place.

District maintenance all comes under the general supervision of E. J. James, chief engineer of the Louisiana Department of Highways at Baton Rouge, La., with E. A. Landry as state maintenance engineer in direct charge of that work.

Electric Drill Kits

A ¼-inch electric drill is available in a choice of two kits with accessories. The Porter-Cable Model 114 shop kit consists of a steel carrying case containing the electric drill, a set of 13 high-speed twist drills for wood or metal, and a horizontal drill stand which converts the portable drill into a stationary bench grinder. The kit also contains a 4-inch wire wheel brush; a 3-inch buffing wheel with a stick of rouge for polishing metals; and a 3-inch grinding wheel for contact grinding and implement sharpening.

Model 113 is a home kit and includes the new electric drill, four high-speed twist drills, a 5-inch rubber back-up pad with three abrasive discs, and a lamb's-wool buff.

The drill itself is the company's new Model 107. It has a Jacobs geared chuck, and a pistol grip with lock-button trigger switch. It is driven by a Universal motor at 2,000 rpm. Weight is 3 pounds 6 ounces.

For further information write to Porter-Cable Machine Co., 17 Exchange St., Syracuse, N. Y., or use the Request Card at page 18. Circle No. 342.

Corps of Engineers News

The Corps of Engineers, U. S. Army, has announced the reassignment of six officers.

Col. George T. Derby will be district engineer for Huntington, W. Va., succeeding Col. John O. Colonna, who is assigned to U. S. Army Forces in the Far East. Col. Thomas B. Simpson has been named district engineer at Vicksburg, Miss. He replaces Lt. Col. George F. Dixon, Jr., who has been assigned to the Office of the Chief of Engineers, Washington, D. C. Col. Robert B. Warren is the new district engineer at Norfolk, Va., replacing Col. William F. Powers, who has also been named to the staff of the Office of Chief of Engineers.

Data on Timber Bridges

Modern timber bridges are discussed in literature issued by Timber Structures, Inc., P. O. Box 3782, Portland 8, Oreg. Standard bridges shown include deck arch, girder, deck truss, bowstring truss, trestle, and composite deck types. Application of arch centering and prefabricated false work is also included.

Each bridge type is illustrated with a photograph of an actual installation and with schematic drawings. The bridges feature special timber connections and glued laminated timbers.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 471.

Adams performance pays off for contractor on 33½ mile road job!

● Easter & Schroeder, Inc., of Griswold, Iowa, are experienced road builders—built 33½ miles of farm-to-market roads last year. With scrapers roughing in the elevations (pictured) two Adams 100 h.p. graders built every mile . . . Mr. Easter, who can grade to "blue tops" with any of them, says he likes his Adams machines because of their "power, easy operation at all times" and because "you can see what you are doing." Bill Hoover, operator, backs him up. Both say that their

On heavy grading, like this, Adams graders quickly show their unequalled capacity—their ability to do more work per dollar of operating cost . . . Prove them on your own jobs.

Adams machines will do more work, operate easier and faster than other popular makes of graders they have used. They compare by experience—and they're in business to make money.

Why don't you try a new, improved Adams? Let your local Adams dealer demonstrate one on your work. Phone him today.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS

Make your next motor grader an ADAMS

The new corrugated-steel dump body by Galion Allsteel is suitable for hauling loads such as hot-mix road materials.

Corrugated Dump Body Hauls Hot Materials

A 5.3-yard corrugated steel dump body for hauling hot materials is announced by the Galion Allsteel Body Co., Galion, Ohio. Because of its corrugated construction, the 2,730-pound body gives greater durability, rigidity, and longer effective life, the manufacturer states. It is also said to be more resistant to wear and friction of rough-edged abrasive materials. Recommended construction uses are transporting heated aggregates and hot-mix road materials.

The hoist cylinder, pump, and control valve are protected from the heat by an asbestos-lined steel cover that moves freely with the action of the hoist cylinder.

Sides are constructed of 8-gage steel and the floor is ¼-inch steel plate. The sides fold into the body floor at a 45-degree angle to prevent material from lodging in corners. This angle is reinforced with 8-gage steel gussets at the body side braces.

The body head has box-type horizontal bracing and full height box-type side bracing that extends up under a 4-inch roll for additional strength.

Over-all body length is 114 inches including a 30-inch scow with a 15-degree angle. The scow eliminates the need for a tailgate on hot material-hauling operations. Width inside the body is 82 inches with 31-inch sides and head.

For further information write to the company, or use the Request Card at page 18. Circle No. 358.

Road-Base Material

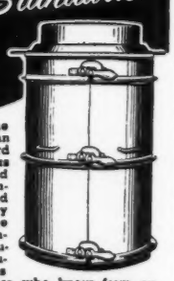
Anhydrite, a mineral found in gypsum beds and mined by the U. S. Gypsum Co., at Southard, Okla., may be the answer to the Oklahoma State Highway Commission's search for new material for constructing road bases. The Commission will improve a 7½-mile stretch on State Route 8, following favorable tests with the new material. The tests were made at the Commission's laboratory after an examination of an experimental haul road built by U. S. Gypsum in 1946. The road was constructed with crushed anhydrite mixed with 15 to 20 per cent soil binder, and then surfaced with a double and a single asphalt treatment. The base is 8 to 12 inches thick.

Laboratory reports indicate that the anhydrite used in the road meets Oklahoma highway specifications for stabilized aggregate base, and that it is a promising source of aggregate for flexible bases. Anhydrite is abundant in Oklahoma and is found in beds associated with gypsum. It is harder than gypsum, and the deposits range in thickness from 3 to 5 feet. The mineral does not weather to an incoherent powder as does gypsum, but remains hard and white.

Diamond Chain Manager

The Diamond Chain Co., Indianapolis, Ind., manufacturer of chains, gears, and couplings, announces the appointment of Jack E. Cooper as southeast district manager, with headquarters in Atlanta, Ga. Prior to his appointment, Mr. Cooper served as sales representative in the Chicago office of the Diamond Chain Co.

THE "Quinn Standard" FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request. Also manufacturers

QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1645-12 ST. BOONE, IA.

OTTAWA STEEL PRODUCTS, INC.

Redesigned All *Hydraulic* Equipment to Incorporate MARVEL Synclinal FILTERS

"After several months use we have checked the hydraulic systems of our machines and although they have worked in extremely dirty conditions, the hydraulic oil is clean."

Harvey A. Martin
Purchasing Agent

SUMP TYPE (Cutaway)

Marvel Filters have scored again. Another Original Equipment Manufacturer added to the over 350 that are now specifying Marvel Synclinal Filters to protect hydraulic and low pressure systems.

Marvel Filters are available in sump and line type models, in capacities of 5 to 100 G.P.M., and in wire mesh sizes from 30 to 200. Both types may be easily disassembled, cleaned and reassembled in a few minutes' time by any workman. This reduces "down-time" to a minimum. Line types operate in any position and may be serviced without disturbing pipe fittings.

WATER FILTERS—Both our sump and line types have been designed for use in all water filtering applications with no change in the basic Synclinal design.

MARVEL Engineering Company

625 W. Jackson Blvd.
Chicago 6, Illinois

Write for Complete Engineering Data — Specify Oil or Water

Meets J. I. C. Standards

Hyster Grid-Roller Movie

A 16-mm sound-color movie, produced by Hyster Co., Portland, Oreg., shows the Hyster grid roller in action on different types of blacktop jobs, including the salvaging and rebuilding of roads and streets. It illustrates the grid-roller method for salvaging aggregate and binder in old bituminous surfaces, and new ways to compact road fills, subbase, and rolling surface courses.

Arrangements to book the film can be made at any Caterpillar-Hyster dealer; or write for information to Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg.

Power Plants Speed Construction
USE POWER TOOLS—FLOOD LIGHTS

WINPOWER PORTABLE ELECTRIC PLANTS provide a dependable, low cost power source . . . speed up work performance by operating time and labor saving power tools.

WINPOWER NITE-HAWK units give power plus flexible floodlights. Every contractor should use these high efficiency, quality built plants.

WRITE FOR LITERATURE AND PRICES

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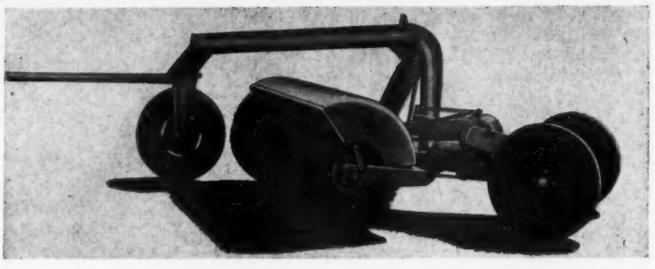
TEL. 236 NEWTON, IOWA

500 to 12,000 watts A.C. or D.C.



Traction-Drive Sweeper

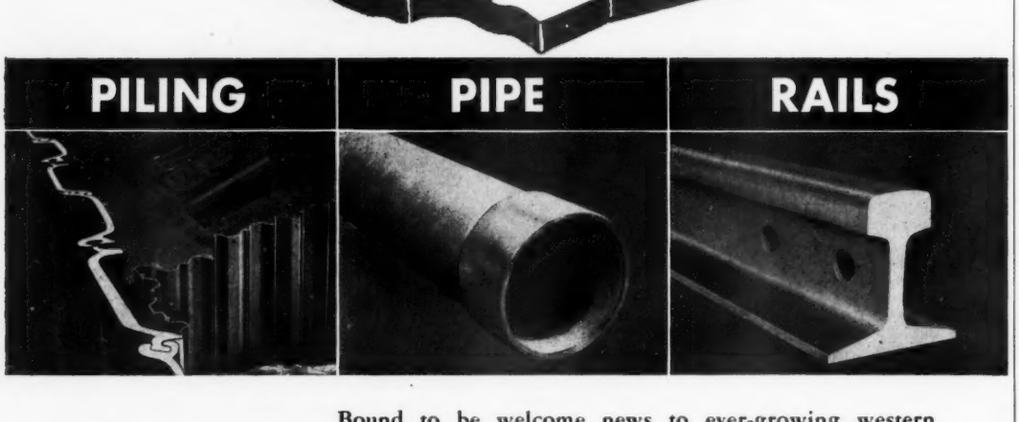
A new traction-driven sweeper, which is towed by a tractor, truck, or other vehicle, features a spring mechanism that permits the brush to float over and sweep uneven surfaces. The Meili-Blumberg Model 53-T has a 96-inch brush that can be operated at a 30-degree angle, right or left. Maximum downward travel is limited by an adjustable linkage to prevent the brush from sucking under. The brush, which is raised and lowered by hydraulic power, is provided with two speeds.

The brush frame itself is a 3½-inch tubular member. The sweeper has a safety lock for transportation at high speed. It may be equipped with a sprinkler attachment for dust abatement.

For further information write to the Meili-Blumberg Corp., New Holstein, Wis., or use the Request Card at page 18. Circle No. 440.

Announcing . . . the opening of
L. B. FOSTER CO's LOS ANGELES OFFICE
Better service for the Western States

PILING | PIPE | RAILS



Bound to be welcome news to ever-growing western industry—L. B. Foster Company opens its Los Angeles headquarters. To users of pipe, rails, and piling who aren't yet Foster customers—we're proud to state that ours is a company that specializes in service—prompt, dependable, backed by the Foster guarantee, and always at the lowest possible prices. Our 50-year list of customers is still growing because buyers seem to "like to do business with Foster." Try us. Let us show you why!

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Booklet on Mapping

The Highway Research Board of the National Academy of Sciences has published a pamphlet on "Mapping and Subsurface Exploration for Engineering Purposes" (Bulletin 65), containing two papers by H. E. Barnes and H. E. Marshall.

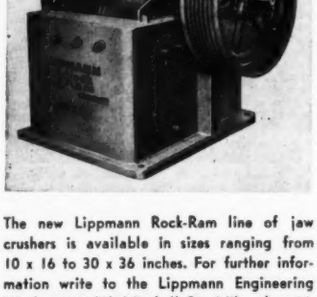
Assisting in the engineering interpretation of geologic and agricultural soil maps, Mr. Barnes presents a new technique of interpretation for resistivity data to obtain depth profiles—an invaluable aid for estimating the variations in thickness of layered materials with similar resistivity characteristics. Mr. Marshall's paper is a review of the Ohio State Department's correlation of geologic and agricultural information with engineering test data to obtain a generalized engineering soil map for the state.

The pamphlet may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C., for 90 cents.

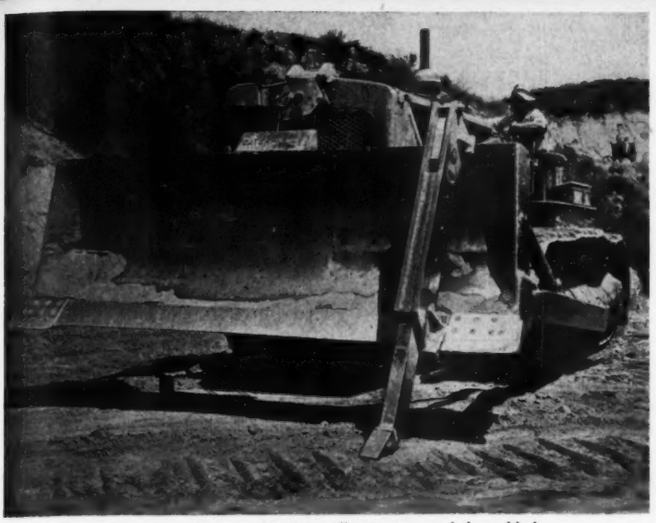
Fort Pitt Bridge Elects

T. A. Straub, Jr., has been elected vice president of Fort Pitt Bridge Works, Pittsburgh, Pa., manufacturer of structural steel.

Mr. Straub has been a director of the company since 1944 and for the past five years served as assistant to the president. He is also president of Electric Welding Co., a subsidiary.



The new Lippmann Rock-Ram line of jaw crushers is available in sizes ranging from 10 x 16 to 30 x 36 inches. For further information write to the Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 456.



The new Preco dozer-ripper for use with Caterpillar tractors and dozer blades.

New Dozer-Ripper

A ripper for use on the front of Caterpillar tractor bulldozer blades is being manufactured by Preco, Inc., 6300 E. Slauson Ave., Los Angeles 22, Calif.

The Preco dozer-ripper clamps onto the Caterpillar 8S and 7S bulldozers. It can be adjusted to rip to depths of 22, 15, or 8 inches, or can be fully retracted. The units can be used singly or in pairs.

The manufacturer recommends the dozer-ripper for pioneering, steep downhill dozing, bank sloping, and for breaking blacktop and light concrete.

Both the replaceable tooth and the shank of the dozer-ripper are made of heat-treated chrome molybdenum steel. The entire unit weighs approximately 650 pounds.

For further information write to the company, or use the Request Card at page 18. Circle No. 346.

Harrison Celebrates

Harrison Construction Co., Pittsburgh, Pa., recently celebrated its 25th anniversary with an employee dinner.

During its twenty-five years of operation, the company has contributed to the construction industry with its development of Oak Ridge, Tenn., and excavation and grading for several southern airports. It has also completed plants and dam sites in various parts of the country.

Pittsburgh Asphalt Products Co., manufacturer and distributor of bituminous paving materials, and Crane & Truck Service, Inc., which maintains mobile equipment for transporting heavy construction equipment and materials, are subsidiaries of Harrison Construction Co.

Highway Equip. Co. Mgr.

It has been announced that William W. Kingman will be general sales and advertising manager for Highway Equipment Co., Cedar Rapids, Iowa, manufacturer of spreaders and bulk delivery equipment.

Mr. Kingman has been Chicago branch manager for Illinois Contractors' Machinery, Inc., and prior to that sales manager for the Manufacturing Division, Maxon Construction Co., Inc., Dayton, Ohio.

Rock and Sand Dryers

A new 4-page brochure on rock and sand dryers has been issued by Standard Steel Corp., 5001 S. Boyle Ave., Los Angeles 58, Calif. The bulletin contains information on the frame mounting, electric drive, and combustion chamber of the units. Close-up photos show the trunnion wheels, and tire mounting.

Details are also given on the latest standard dust collectors and wet washing systems.

To obtain this literature write to the company and request Bulletin No. 5323, or use the Request Card at page 18. Circle No. 367.

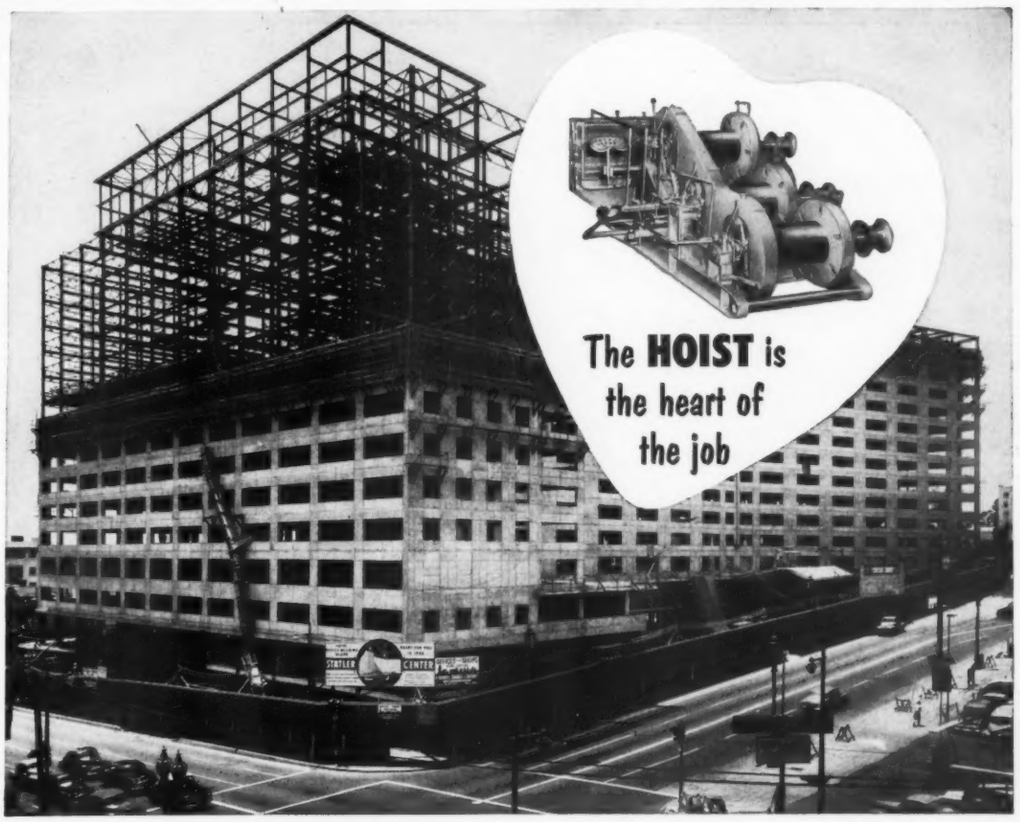
CHOOSE a CHAUSSE Model CJD-400 for your SMALL jobs

This new addition to the CHAUSSE line of Spreadwell Distributors is specially designed for ease in manipulating all controls. Note the operator's platform at left rear, where all controls are within easy reach. Like all CHAUSSE spreaders, this new model is the last word in rugged, dependable, efficient performance.

Write for specifications.

CHAUSSE Manufacturing Co., Inc. - 4453 Fourteenth St. - Detroit 8, Michigan

Amrocta Co., 50 Church St., New York 8, N.Y. Cable Address: Kellydick



No matter how much you spend on bigger, faster trucks, motorized concrete buggies, or any other equipment, the steady speed of your crews will always depend on the *hoist*.

That's why experienced contractors take no chances, in buying hoists. On the great new Statler Center in Los Angeles, pictured above, the entire job of lifting concrete was handled by one hoist—an American Model 100 3-drum electric, shown in inset. Its smooth, cool-running outside band clutches, rock-solid bed and side frames, and perfectly aligned shafts kept it running night and day, week after week, month after month.

Two other Americans, handling miscellaneous materials, showed the same unfailing dependability on the Statler project. If you, too, want absolute safety *at the heart of the job*, choose exactly the size and type of hoist you need from the broad American line. Your American Hoist distributor can give you the best kind of service and advice.

3101

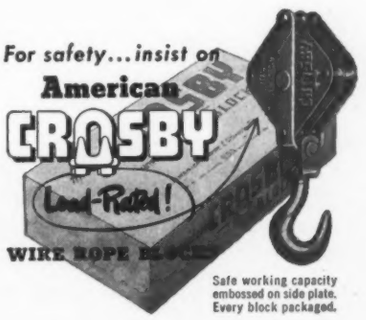
Modernize...economize...with

American Hoist

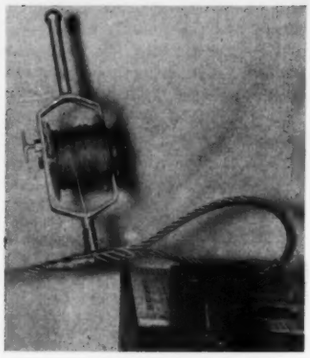
AMERICAN HOIST & DERRICK CO. • ST. PAUL 1, MINN.

For safety...insist on

American



Safe working capacity embossed on side plate. Every block packaged.



Wire-Splicing Tool

A new tool for serving wire, hemp, or strand on wire-rope splices has been announced by S. W. Elliott Wire Rope & Slings, Montoursville, Pa. A steel head, which comes in three sizes, guides the wire. The tool serves it at a uniform tension that can be adjusted.

Two wooden heads of a different size are used for serving wire rope with hemp.

Size of spool used is 4¾ x 3 x 1¾ inches and holds approximately 5 pounds of wire. Spools are interchangeable.

For further information write to the company, or use the Request Card at page 18. Circle No. 449.

Baker-Lull Representative

J. Irwin Moore has been appointed southern states district representative for Baker-Lull Corp., Minneapolis, Minn., manufacturer of materials-handling equipment.

Mr. Moore will service Baker-Lull distributors in Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, New Mexico, Oklahoma, Tennessee, and Texas.

Pipe Jacking Speeds Drainage Projects

Forcing pipe through embankments is preferred where heavy traffic delays pipe-laying operations

• PIPE-JACKING techniques simplify the forcing of pipe through highway and railway embankments to increase drainage capacity without delaying traffic traveling above. The jacking technique is in contrast to the more common method of excavating an open trench, placing the structure, backfilling, and rebuilding the traffic surface above it.

Increasing the flow capacity of a drainage structure almost always entails making an increase in the drainage opening under the fills. The problem develops into one of providing the additional waterway opening with the least hazard and inconvenience to the traveling public and construction crews.

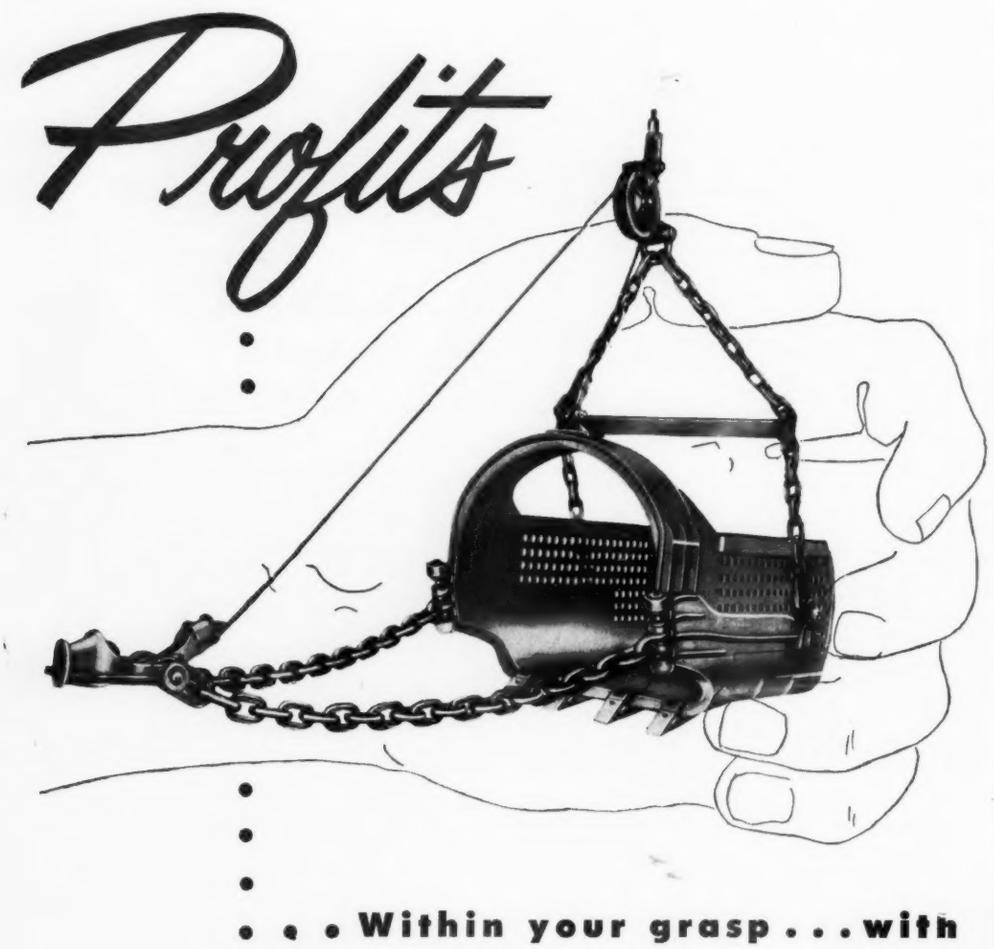
When traffic offers too great a hazard to construction crews or too much inconvenience and danger to users, additional drainage structures may be provided by jacking pipe through the enbankment.

Jacking Methods

Jacking consists, essentially, of tunneling an opening and forcing or jacking a structure of permanent material through the opening in the embankment to the line and grade desired. In normal practice the leading edge of the structure being jacked is kept immediately behind the tunneling operations as this provides protection for the working crews.

Frequently, the need for additional drainage openings occurs in flat slow-draining terrain where the traffic surface has a comparatively low grade.

Under these conditions the corrugated-metal pipe-arch-type drainage structure can be jacked through, assuring a minimum of drainage opening for a minimum of headroom requirement. It should be large enough to allow workmen inside the pipe. Sizes of these pipe-arch structures vary from a minimum of 18-inch span by 11-inch rise to a maxi-



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A TYPE & SIZE FOR EVERY DIGGING PURPOSE!

HENDRIX BUCKETS

3/8 to 40 Cubic Yards

HENDRIX Lightweight DRAGLINE BUCKETS

Hendrix Buckets Also Available Without Perforations On Special Order Only

HENDRIX MANUFACTURING CO., INC.

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SALES RENTALS

CAPACITY TO 600 TONS

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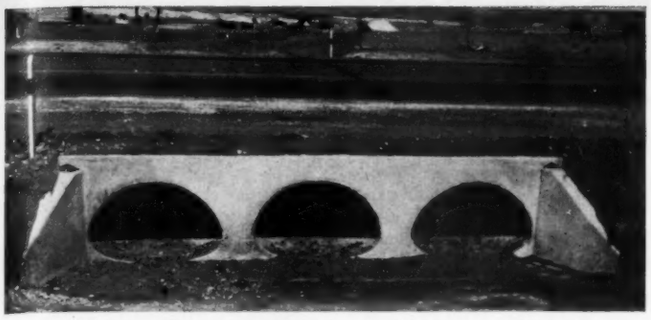


A battery of three Armco corrugated-metal pipe arches that have been jacked under a busy highway. Extremely low clearance did not permit the use of full round pipe.

mum of 72-inch span by 44-inch rise.

Pipe-Arch Jacking in West Texas

Corrugated-metal pipe-arch jacking was undertaken recently along U. S. 60 and 87 between Amarillo and Canyon in west Texas.

The project required 19 structures of Armco corrugated-metal pipe-arch structures, with a 50-inch span by 31-inch rise. The structures varied in length from 58 to 104 feet. The pipe-arch to be jacked was supplied in 12-foot sections, with shorter sections for connections in the open trench at each end.

Jacking pits or trenches were excavated, beginning at a point 5 feet from the edge of the pavement on an elevation slightly below that of the required flow line. Jacking equipment, consisting of cross ties and rails, was then placed in the pit so that the pipe-arch would be on line and grade when placed on the rails. Two 75-ton hydraulic jacks, one operating on each rail, were used to jack or force a 12-foot section of pipe-arch against the embankment.

A laborer then entered the pipe-arch and by means of short-handled digging tools began to excavate an opening or tunnel in the shape of the pipe-arch ahead of the structure. Spoil from the excavation was removed by a small 4-wheel cart. Excavation went forward approximately 2 feet before the pipe-arch was jacked into the opening. Line and grade were then checked before the operation was resumed.

This alternate digging and jacking continued until about 10 feet of the 12-foot section had been jacked. At this point, another 12-foot section was placed on the jacking rails, and field-connected with galvanized bolts to the pre-punched (match-punched) end of the section already in place. These operations were repeated until the required length of pipe-arch was in place.

Most of the pipe-arch structures were installed where a minimum of embankment cover existed. Due to this condition, the alignment and grade of the structure were of particular importance. An engineer's level was used for grade control and a transit for alignment control.

The jacking method of installing additional drainage openings through an embankment is somewhat slower than normal construction procedures. However, it offers a much greater measure of convenience and safety to the traveling public than the normal method.

From information supplied by O. M. Carter, drainage specialist, Armco Drainage & Metal Products, Inc., Middletown, Ohio.

Splash-Proof Marker

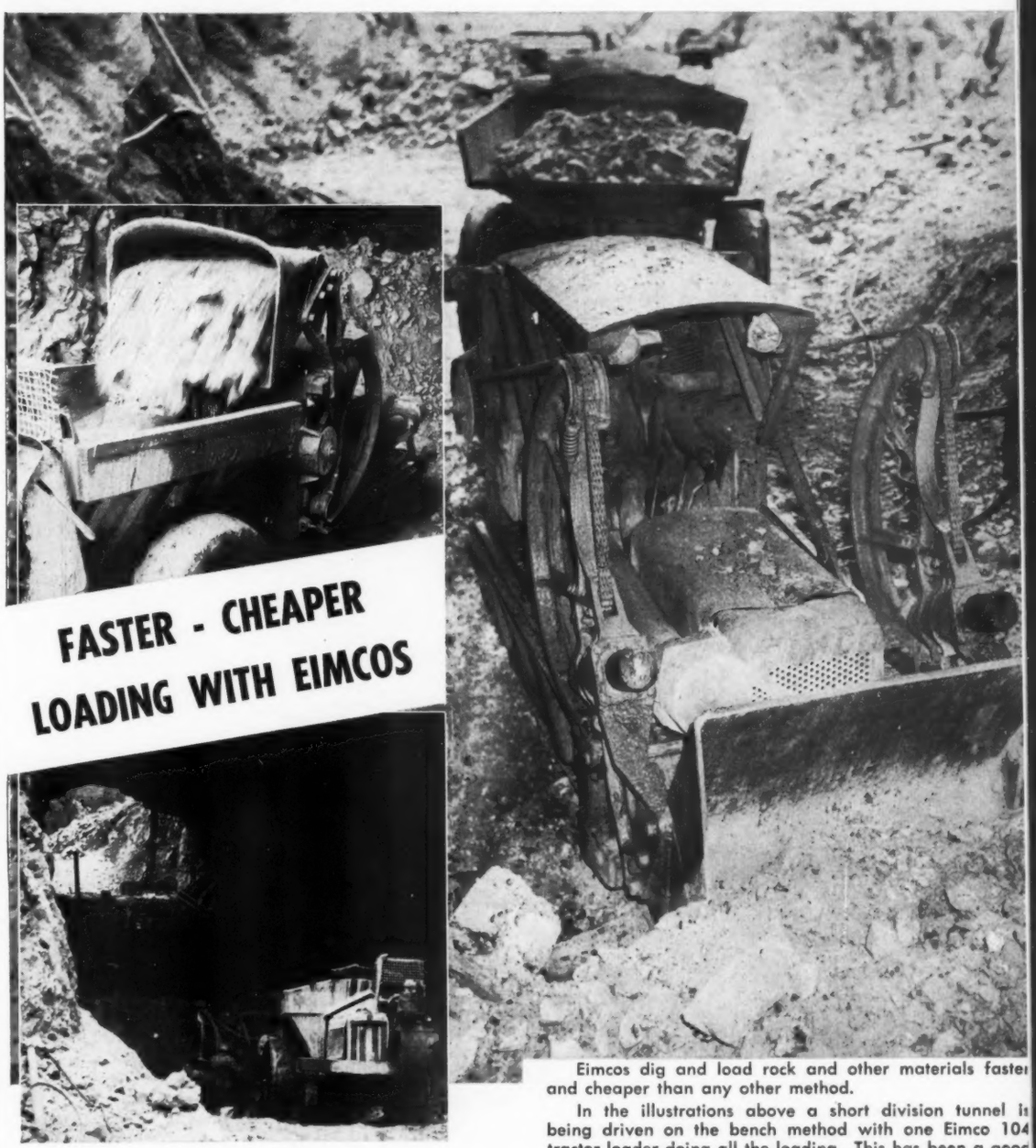
A new splash-proof reflectorized-stake delineator for marking curves both day and night on highways, streets, and parkways is announced by Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn. Chief feature of the stake is that its non-reflective side is positioned parallel to the highway to act as a baffle that keeps the road splash from the reflective surface.

The stake has a reflective area of 1¾ x 24 inches of silver Scotch-lite sheeting. It is 8 feet long with a 2 x 2-inch 90-degree angle, made from 14-gage sections of galvanized rust-resistant steel.

For further information write to the company, or use the Request Card at page 18. Circle No. 378.

Fairbanks, Morse News

Franz F. Kaiser has been appointed chief industrial engineer by Fairbanks, Morse & Co., Chicago, Ill., manufacturer of compressors, generators, pumps, and scales. Mr. Kaiser's duties will pertain to plant layout, plant engineering, tool engineering, processing, work standards, and time study. He has been in turn project engineer, chief layout engineer, and chief tool engineer.



Eimcos dig and load rock and other materials faster and cheaper than any other method.

In the illustrations above a short division tunnel is being driven on the bench method with one Eimco 104 tractor loader doing all the loading. This has been a good job for the contractor because of the low cost loading performance of his Eimco loader.

For rugged dependability in loading equipment on any size job see your Eimco representative first.

Write for literature on Eimco loaders.

You can't beat an Eimco

EIMCO A460

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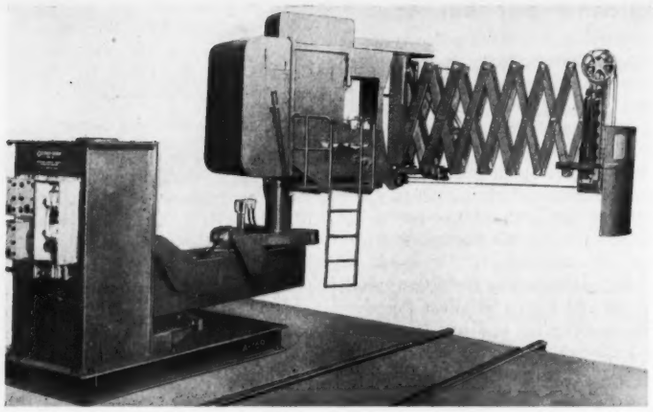


As the operator directs the pantagraph arm of the S-A box-car unloader, the scoop drops down and withdraws a load of material.

Box-Car Unloader

A new box-car unloader can be placed between two tracks, to service cars on either track. The unloader handles sand, cement, and all bulk materials up to 2-inch lump size. A pantograph arm has a scoop that reaches into the car until it meets an obstruction, and then drops down and pulls out a load of material, discharging it to a track-side hopper. This cycle continues automatically, the operator taking only enough time from other tasks to direct the arm to different sections of the car.

When not in use the unloader size is 8 by 24 feet. It requires only a single concrete footing for track-side mounting.

For further information write to the Stephens-Adamson Mfg. Co., Aurora, Ill., and request Bulletin 253, or use the Request Card at page 18. Circle No. 457.

Remember, safety is no accident.

New Steel-Rod Shear

A shear for cutting steel rods of various kinds and sizes is announced by Whitney Metal Tool Co., Rockford, Ill. The No. 400 rod cutter consists of a movable shear blade and fixed shearing die. Both parts are replaceable. The blade is moved by a geared 48-inch lever.

The tool will shear mild steel rods from ⅛ to ¾ inch in diameter. The rod cutter weighs 42 pounds and can be carried to the job, but may also be mounted on the bench in the shop.

For further information write to the company, or use the Request Card at page 18. Circle No. 395.

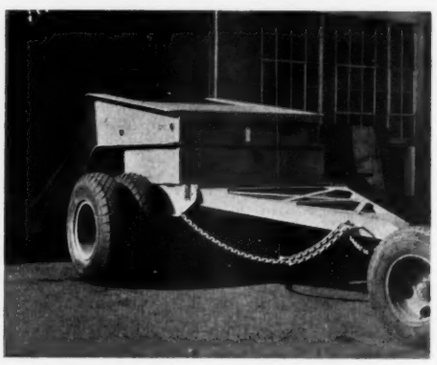
Electrodes Compared

Electrodes of special carbon-graphite composition have been developed for use with Arcair gouging and cutting torches. Relative qualities of Arcair carbon-graphite electrodes are compared to all-carbon or all-graphite electrodes, and details of performance are given in a new booklet just made available.

To obtain this literature write to the Arcair Co., 2614 Burwell St., Bremerton, Wash., or use the Request Card at page 18. Circle No. 349.

BIG and TOUGH

Giant 100-ton Dorsey MTS built for Contractor on Atomic Energy Commission project

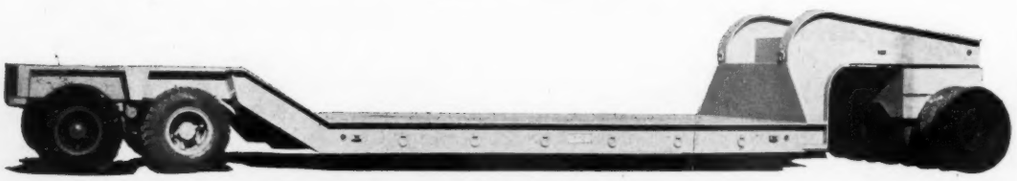


DORSEY TRAILERS

HEAVY-DUTY LOW BED TRAILERS 15 to 75 Tons (up to 100 tons on special order)

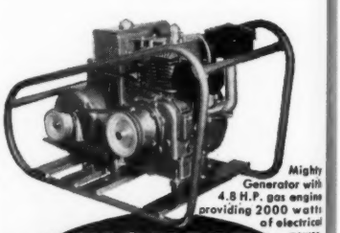
TILT-TO-LOAD TRAILERS
OIL FIELD FLOATS

For safe transportation of huge items of delicate electrical equipment and process apparatus for uranium 235 production, F. H. McGraw & Company uses this special Dorsey Low Bed. It's 87 feet long and 12 feet wide and the rear tires are 16 ply, 12.00x20.



Call your Dorsey Distributor — or Wire us collect

Dorsey Trailers—Elba, Alabama



Mighty Generator with 4.8 H.P. gas engine providing 2000 watts of electrical power.

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where and when you need
PORTABLE POWER!

Pioneer Generators with gasoline engines give *quick*, portable power and light for your every day needs. Experience of 20 years in building outstanding generators prove that PIONEER Generators are properly engineered, and *ruggedly constructed.* Priced *economically.* **Write today** for illustrated catalogs and prices on 500 to 5000 watt PIONEER Generators. They can save you time, work and money!

PIONEER Gen-E-Motor Corporation
5832 West Dickens Avenue, Chicago 39, Illinois

White Curing Compound

A new white concrete-curing compound is announced by Aluminum Industries, Inc., 2438 Beekman St., Cincinnati, Ohio. Permite PW-40 has a resin-wax base.

The manufacturer states that by reflecting the infra-red rays of the sun, the compound protects concrete from premature cracking. The pigmentation of the compound helps to obtain uniform coverage.

It is packaged in 55-gallon agitator-type drums, and is sprayed on to form a film which seals in the mixing water. The compound is also supplied in a clear form.

For further information write to the company, or use the Request Card at page 18. Circle No. 436.

Sheepsfoot Roller Tips

New literature describes replaceable tips for sheepsfoot tampers. The Tamprite tip consists of a welded-on shank and the tip which fits over a tapered shank. Two types of tips are made, one for earth tamping and one for rock tamping.

A variety of sizes with various tamping areas is carried in stock.

To obtain this literature write to Los Angeles Steel Casting Co., 6100 S. Boyle Ave., Los Angeles 58, Calif., or use the Request Card at page 18. Circle No. 407.

Panama Canal Project

The first major overhaul of the Panama Canal since it was opened in August, 1914, has begun with a quarter-million-dollar order for new motor controls for the locks, received by Federal Electric Products Co., Newark, N. J. This is part of the first phase of a 10-year plan to overhaul the Canal, thus enabling it to handle more ships. The first phase is to be completed by 1956, and will cost an estimated $1,500,000.

Without interrupting Canal service, the motor controls now in operation are to be replaced and the lock culverts repaired. Completion of these plans should enable the Canal to handle expected increases in traffic over the next 40 or 50 years.

There is a GM Diesel Engine Distributor Near You

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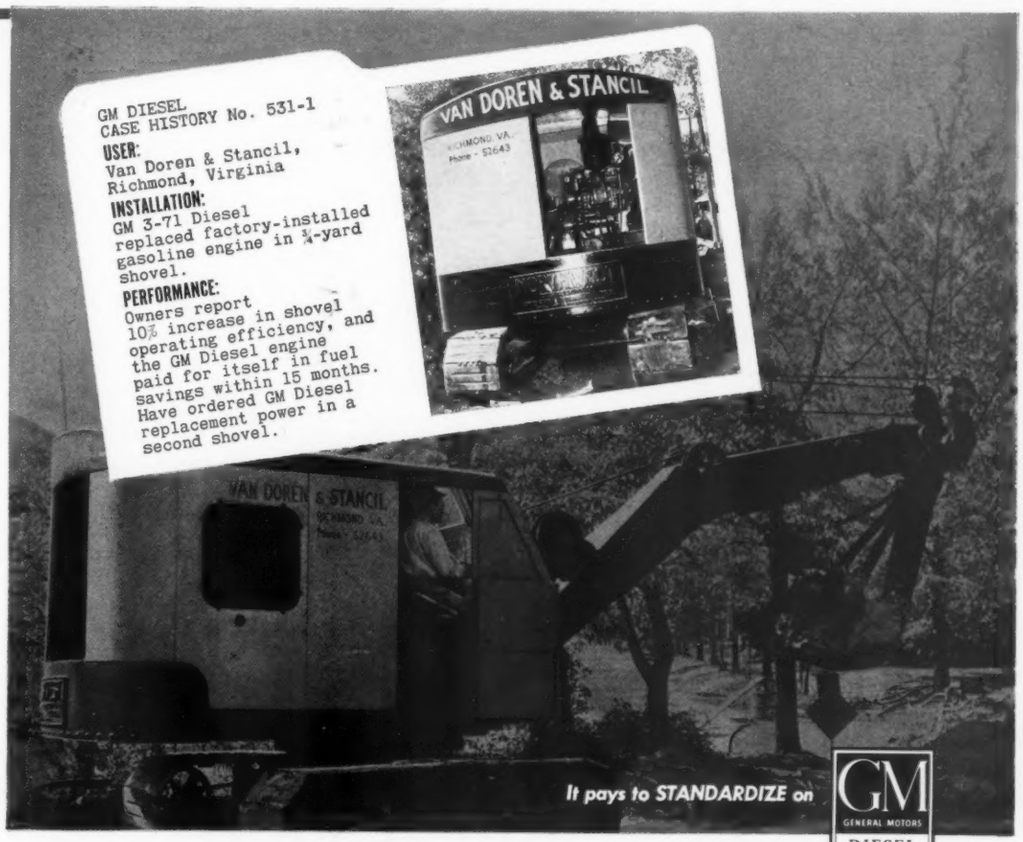
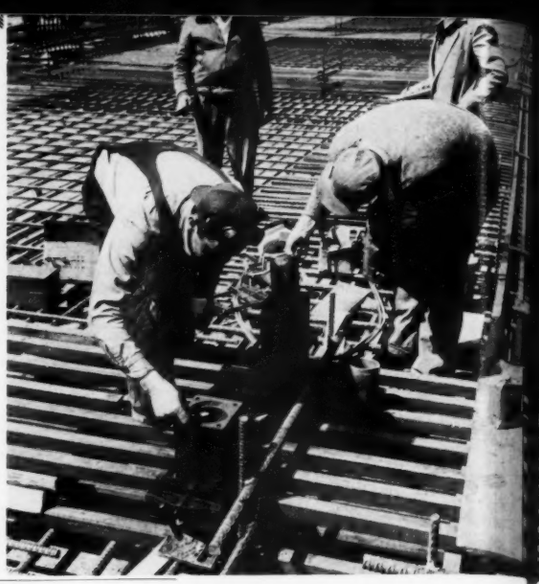
WYOMING—Casper
THE COLORADO BUILDERS' SUPPLY CO. (Equip. Div.)



PAID FOR ITSELF IN 15 MONTHS IN FUEL SAVINGS ALONE

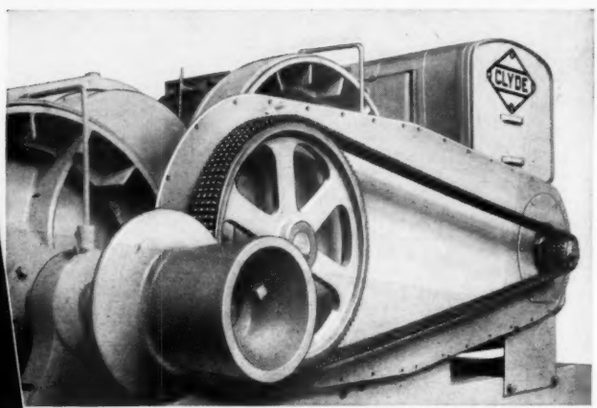
This Virginia contractor reports that the shovel had been using 5 to 5½ gallons of gasoline per hour, at a cost of 21 cents a gallon. With the installation of the General Motors Diesel, however, the shovel used a maximum of 2 gallons of Diesel fuel per hour, at a cost of 13.2 cents a gallon. These results were even better than the dealer quoted. But they're typical of the economy you can expect when you switch from gasoline to GM Diesel power. These rugged *2-cycle* Diesels fit in the same space as industrial gasoline engines of comparable horsepower. They are easy to start, cost little to operate and maintain, and deliver a smooth, responsive flow of power that gets work done faster. Ask your nearest GM Diesel distributor to show you how this low-cost Diesel can pay for itself in your equipment.

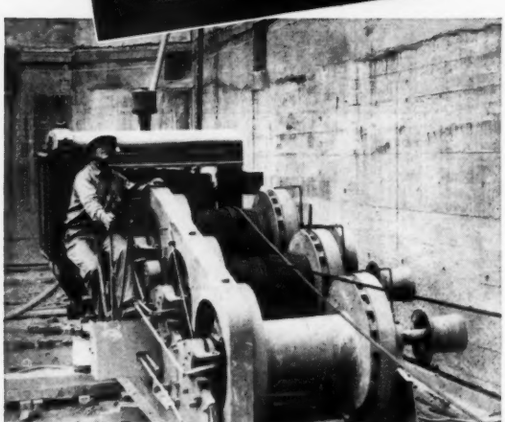
DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.



Where power to the load-

MUST NOT FAIL!





Clyde 3-drum Frame-6 Hoist equipped with Diamond Roller Chain as shown at top of page.

For Fast, Safe, Sure Hoisting, Lowering, and Spotting of Loads,

DIAMOND ROLLER CHAINS

Have Thoroughly Demonstrated

- ✓ *GREAT RESERVE STRENGTH*
- ✓ *LONG-LIFE DEPENDABILITY*
- ✓ *SURE, SAFE, NON-SLIPPING TRANSFER OF POWER FROM SOURCE TO LOAD*

Without the utmost reliability of power transfer from source to drums, hoist operation cannot be safe, accurate or efficient. Diamond Roller Chains through the years have proved the value of uniformity—link for link,—of reserve strength and smoothness of operation. Being positive, without slip or creep, loads are lifted, lowered and spotted with precision.

Hoist manufacture may not be your problem, but the same dependability of power transfer that Diamond Chains provide is important on every type of machinery.

SHOT-PEENING SINCE 1944

Diamond Chain has long recognized that certain types of internal stressing of chain parts would increase fatigue resistance. To this end, link plates have been specially processed and chain rollers and other parts have been shot-peened since 1944.

★ ★ ★

Diamond Chain has improved the pin and bushing holes in the link plates by proper pitch hole preparation. Pins and bushings are case hardened.

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Dept. 487, 402 Kentucky Avenue, Indianapolis 7, Indiana

Offices and Distributors in All Principal Cities

Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

DIAMOND ROLLER CHAINS

Bars Spliced by Welding 1. Workmen place the two halves of the mold over the ends of the bars to be welded, and clamp them securely together. They then calk all spaces where the molten metal might escape, using a specially prepared foundry sand. **2.** The neck of the funnel-shaped upper section of the mold is stopped with a metal disk. The workman at the left carefully places a teaspoon of steel punchings on the disk while his partner adjusts the funnel extension ring. Then Thermit welding powder is poured into the mold, followed by a teaspoon of flash powder.

Reinforcing Bars Are Spliced by Welding

THE PROBLEM: To provide continuous 2-inch-square reinforcing bars in lengths up to 190 feet.

THE SOLUTION: Thermit butt-welds.

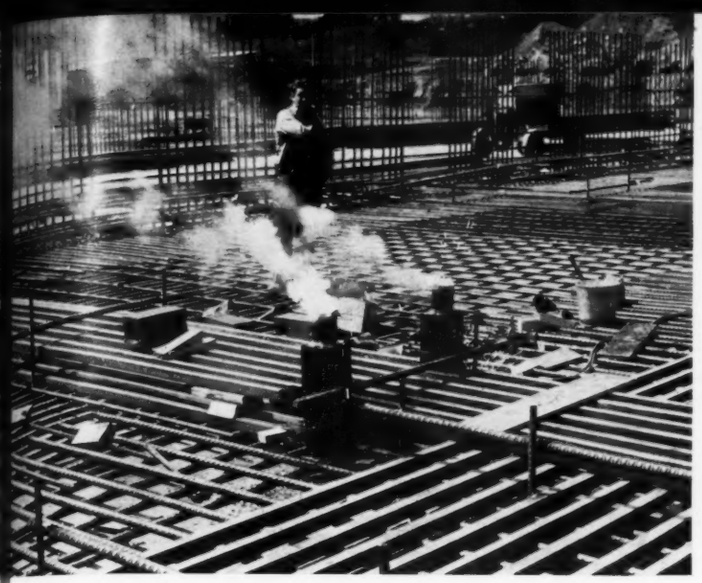
This, in very few words, is the story behind the Construction Camera photos above.

Several layers of 2-inch-square bars grouped as closely together as possible and running in both directions make up the beam reinforcing in the base slab of the huge caissons for the New York Thruway bridge over the Hudson River. (See general article on page 10.) In the width of the structure, these bars must be 100 feet long; in the length they are 190 feet. Spacing of bars both horizontally and vertically is such as to prohibit normal splicing techniques, thereby dictating the butt-welding of the bars into continuous lengths.

Faced with the problem of producing these lengths from stock bars 67 feet 6 inches long, Corbetta Construction Co., New York, N. Y., welded the bars together by means of a new Thermit welding process recently developed by Metal & Thermit Corp., New York, N. Y., and Corbetta Construction Co. for this purpose. Approximately 1,000 of these welds were made on 1¼-inch and 2-inch-square bars.

Bars are first assembled in place with about ½ inch of space between the ends to be welded, and the ends are brought into alignment. A specially prepared sand mold is then placed over the joint and securely clamped in place.

The molds are made of baked foundry sand and are not re-usable.



3. Touched off with a spark from a lighter, the flash powder ignites the welding powder and a miniature volcano erupts within the mold. The resulting molten steel melts the disk seal and flows into the space between the ends of the bars, uniting them in a weld which equals the strength of the parent metal. **4.** Project engineer George Coneva points out the cores of slag which remain after the mold is removed. When these are knocked off, a smooth strong weld remains. In fact, tests made regularly show that the welds usually prove stronger than the parent metal.

They are designed to hold 5 pounds of welding compound, which is the proper amount for welding 1¼-inch bars. In order to increase the capacity to 8 pounds for the 2-inch-square bars, Corbetta simply added a short pipe sleeve of the same diameter as the funnel.

When the mold is clamped in place, all openings are carefully calked with a special molding material to prevent the escape of any molten metal. A steel disk about the size of a half-dollar is then placed at the bottom of the funnel-shaped portion of the mold to act as a seal and prevent any of the materials in the funnel from reaching the lower area until the proper time.

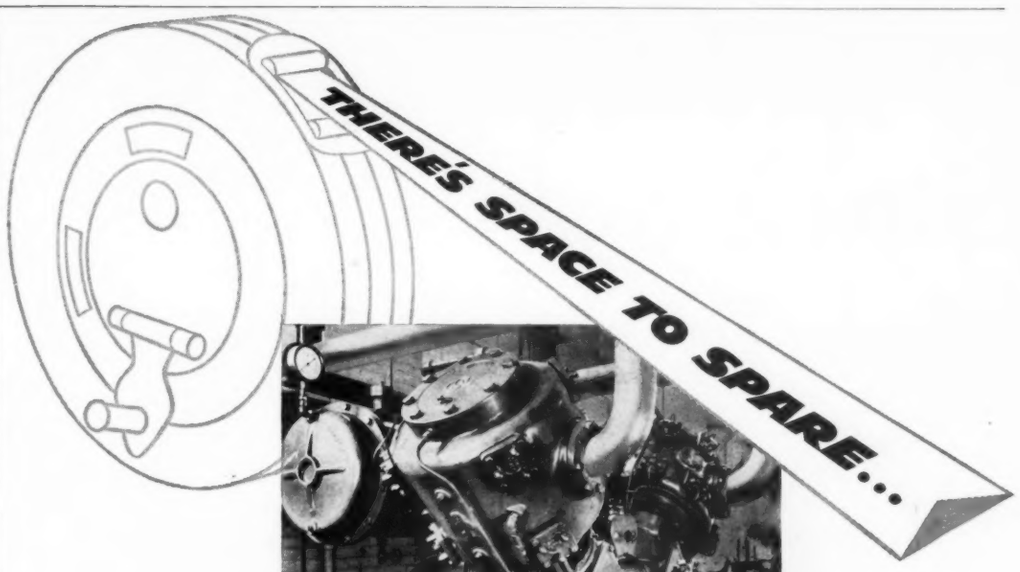
A teaspoonful of fine steel punchings is carefully sprinkled over the metal disk after which the Thermit welding compound is poured into the funnel.

Miniature Volcano

A spark from a lighter of the type used to ignite welding torches ignites the starting Thermit which in turn ignites the welding compound. The welding Thermit consists essentially of ferrous oxide and aluminum. The resulting combustion produces aluminum oxide and iron as well as a display of smoke and fire resembling a miniature volcano.

When the molten iron has become hot enough, it melts the steel punchings and the steel disk, and flows into the lower part of the mold where it forms the weld. When the mold is removed, the slag can be broken off with a hammer and the resulting weld appears as a slight bulge in the bar.

Test welds are made regularly, and when tested to failure, the welds have usually proved stronger than the original bar.



when you install a **TYPE Y** compressor

Chicago Pneumatic's compact, heavy-duty Type Y Compressor is ideal where space is limited. It takes up minimum floor area, but is designed for continuous heavy service. Shipped as a complete "package" ready for easy installation, it requires the simplest of foundations – needs no alignment.

The highly efficient Type Y Compressor has roller main bearings, precision connecting rod bearings, multi-step capacity regulation, and an easy-to-clean shell-and-tube intercooler.

Available in sizes from 75 hp to 250 hp, 410 cfm to 1663 cfm, and with flange mounted, belted and coupled motors. Write for Bulletin 766. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

Chicago Pneumatic

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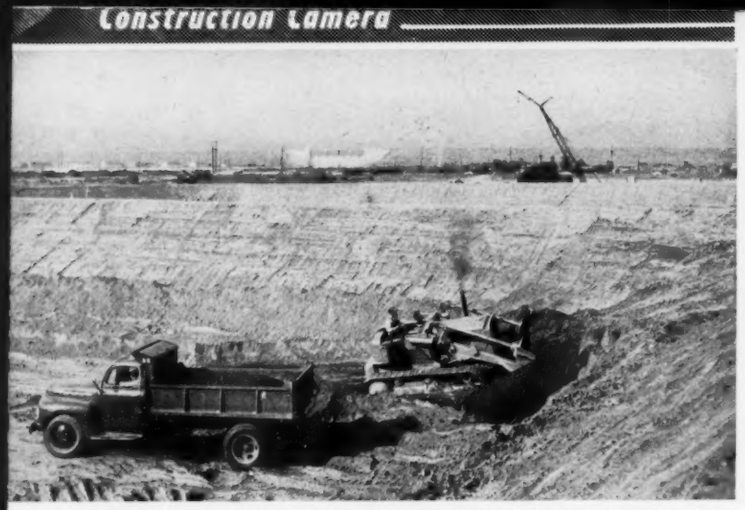
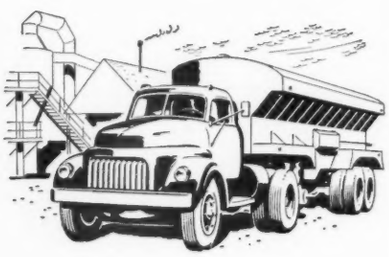
Construction Camera

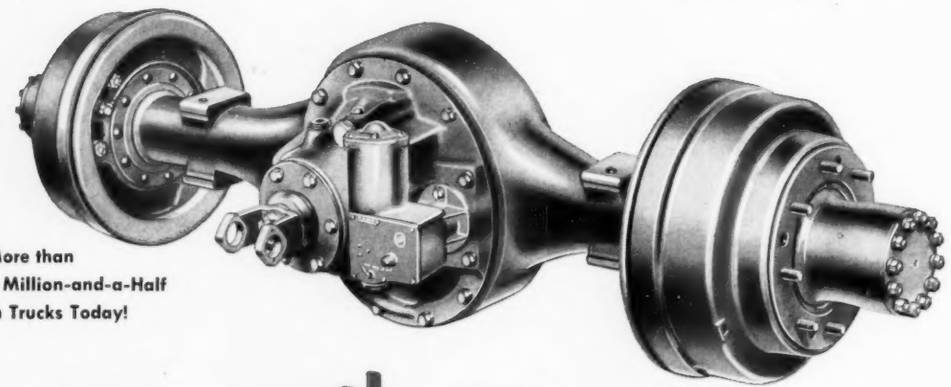


New Steam Plant—Fire walls for three new oil-storage tanks near Sun Valley, Colo., are near completion as this Allis-Chalmers HD-9 tractor trims the slopes. Kerby & Erwood of Van Nuys, Colo., is using the diesel-powered unit to load about 1,000-cubic yards per 8-hour day.

Lucky Peak Dam—Barren terrain southeast of Boise, Idaho, provides scenic background for construction work on Lucky Peak Dam. Loaded to the hilt, a Caterpillar No. 20 wagon pulled by a DW20 tractor rounds a sharp turn on the way to the embankment. This is a joint venture of Morrison-Terteling-Macco-Puget Sound.

On the Job or on the Trade Eaton 2-Speed Axle Trucks





More than a Million-and-a-Half in Trucks Today!

are worth more

Eaton 2-Speeds double the conventional number of gear ratios. Trucks make more and quicker trips, with full payload, over all kinds of roads, in all types of service, at lower operating cost, with minimum upkeep. Engines operate within their best speed range; stress and wear are held to a minimum. Eaton 2-Speed Axle trucks last longer, earn more, and are worth more on the trade-in. Ask your dealer to explain.

EATON AXLE DIVISION
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PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Expandable Forms

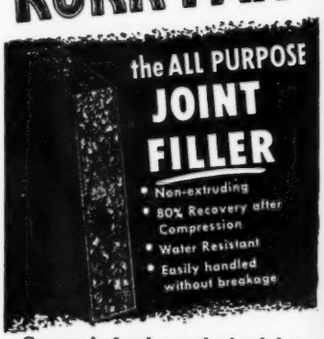
Expandable concrete forms that adjust to any proportions of length and width are shown in literature from Kurt Orban Co., Inc., 205 E. 42nd St., New York 17, N. Y. Rubora expansible concrete forms consist of wooden struts which are latticed together and hinged at the intersection points. After adjustment at the job site to the desired panel dimensions, the form is covered with Sisalkraft paper for rough-finished work, or with a liner of ⅛-inch composition board for a smooth finish.

A representative Rubora form, Type A, can be expanded to cover an area of 30 square feet. It can be adjusted to any set of dimensions between 5 feet 8 inches x 1 foot 4 inches and 10 feet 4 inches x 9 inches. For transportation and storage, the forms contract to about one-fourth of their maximum area.

The literature shows the forms used in building walls, floors, and roofs.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 455.

KORK-PAK**



Composed of cork granules bonded together with asphalt between two sheets of heavy asphalt-saturated paper, KORK-PAK is the lowest cost, non-extruding joint filler on the market. KORK-PAK is readily handled without breakage . . . and when used in conjunction with Para-Plastic Joint Seal, always provides complete joint filling and protection.

Write for details and prices on KORK-PAK. Catalog sent without obligation.

*KORK-PAK *is one of the many Patented products developed for the Construction Industry by Servicised Products Corp.*

SERVICISED PRODUCTS CORP.
5051 W. 65TH ST. • CHICAGO 38, ILL.

Ammonia Plant Rises—With towers already on their foundations and several other structures partly finished, a new ammonia plant for Shell Chemical Corp. at Ventura, Calif., is now well on its way to completion. The M. W. Kellogg Co., a subsidiary of Pullman, Inc., is now building the huge unit to handle over 150 tons of anhydrous ammonia daily.

Escorted to Work—On the way to help build an airfield for the European defense plan, these Caterpillar DW21 scrapers, complete with motorcycle police escort, climb a winding mountain road in northern Italy. One hour after being turned over to the Construzioni Alta Italia, the big units were stripping overburden.

Structural Sections

Structural sections, including studs, joists, and accessories for the erection of steel building framework, are shown in a new bulletin from Penn Metal Co., Inc., 205 E. 42nd St., New York 17, N. Y. The sections are fabricated from strip steel by cold rolling.

Penmetal Lightsteel structural sections are recommended for single and multiple residences, schools, industrial and commercial structures, load-bearing partitions, and exterior curtain wall framing in multiple-story buildings.

The booklet has engineering drawings of typical pieces available.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 431.

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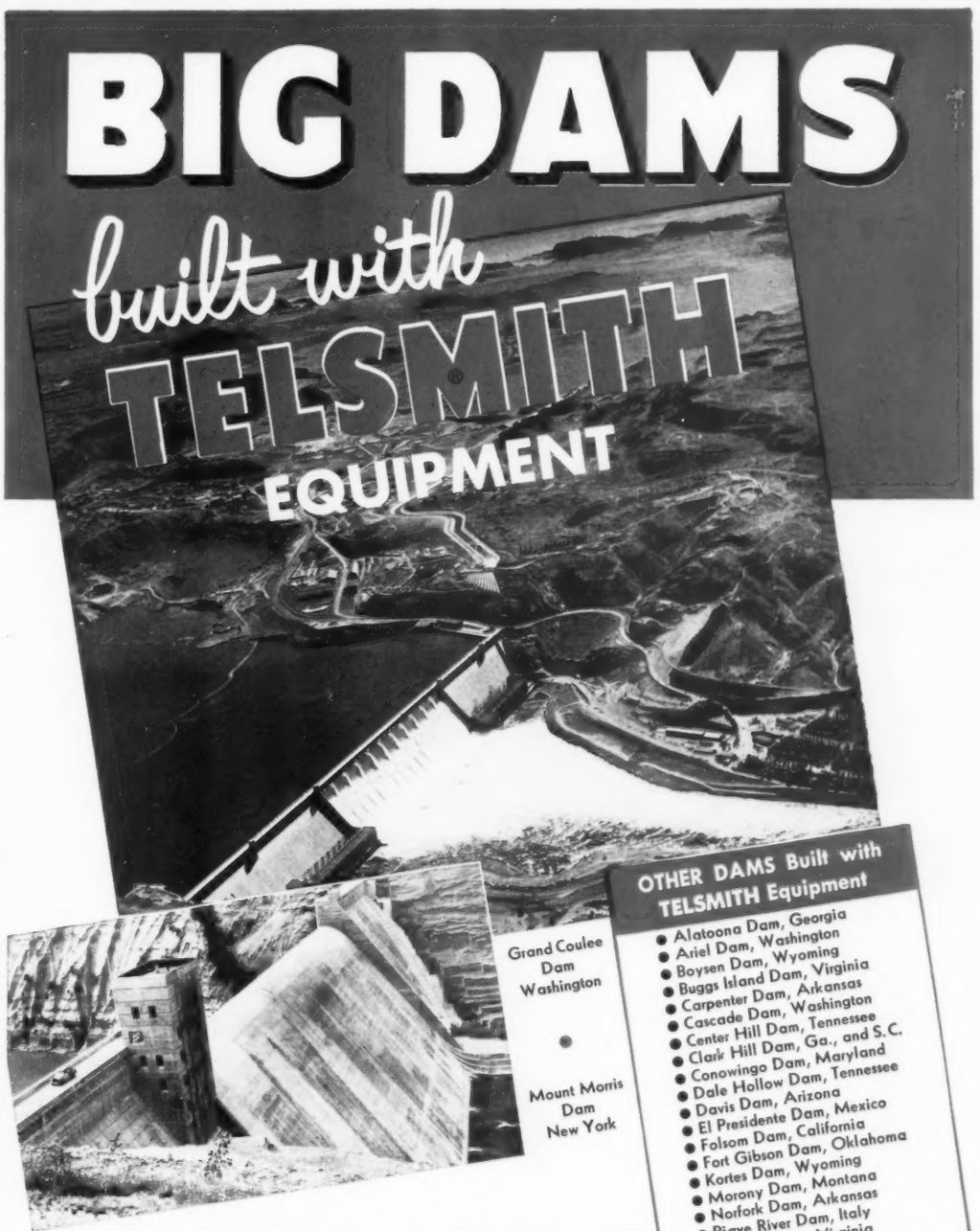

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- Clark Hill Dam, Ga., and S.C.
- Conowingo Dam, Maryland
- Dale Hollow Dam, Tennessee
- Davis Dam, Arizona
- El Presidente Dam, Mexico
- Folsom Dam, California
- Fort Gibson Dam, Oklahoma
- Kortes Dam, Wyoming
- Morony Dam, Montana
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On one big dam project after another . . . all over the world . . . you'll find dependable low cost Telsmith Aggregate Plants and Equipment preferred by prominent contractors. Send for Bulletin 266.

M-14

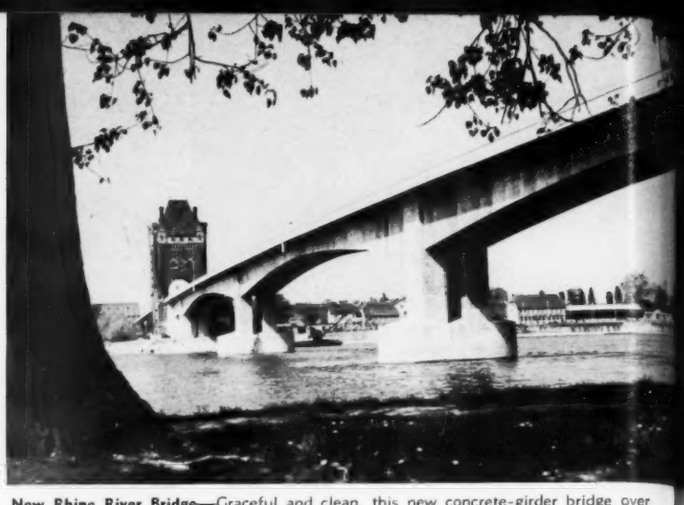
SMITH ENGINEERING WORKS, 4014 N. HOLTON STREET, MILWAUKEE 12, WISCONSIN

Cable Address: Sengworks, Milwaukee

51 East 42nd St. New York 17, N. Y. • 211 W. Wacker Drive Chicago 6, Ill. • 713 Commercial Trust Bldg. Philadelphia 2, Pa. • 238 Main Street Cambridge 42, Mass. • Boehck Eqpt. Co. Milwaukee 3, Wis. • The McLean Co., 3525 Lakeside Ave. Cleveland 14, Ohio

Marens Eqpt. Co., 432 Main St., Rochester, Mich. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Robert S. Bailey, 816 W. 5th St., Los Angeles 17, Calif. • Clyde Eqpt. Co., Portland 9, Ore., & Seattle 4, Wash. • Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 10, Va.

Pipeline Project—The El Paso Natural Gas Co. closes the final link in its 800-mile pipeline through the southwest. Near Kingman, N. M., the pipe-laying crew ran into a 19-mile section of tough malapai rock which required extensive blasting. About 31 miles of softer material was cut by this Buckeye 48 ditching machine.



New Rhine River Bridge—Graceful and clean, this new concrete-girder bridge over the Rhine near Worms, Germany, presents a sharp contrast to the jagged lines of the old tower. Traffic began rolling across the river last month for the first time since the original bridge was destroyed during World War II. *Wide World Photo*

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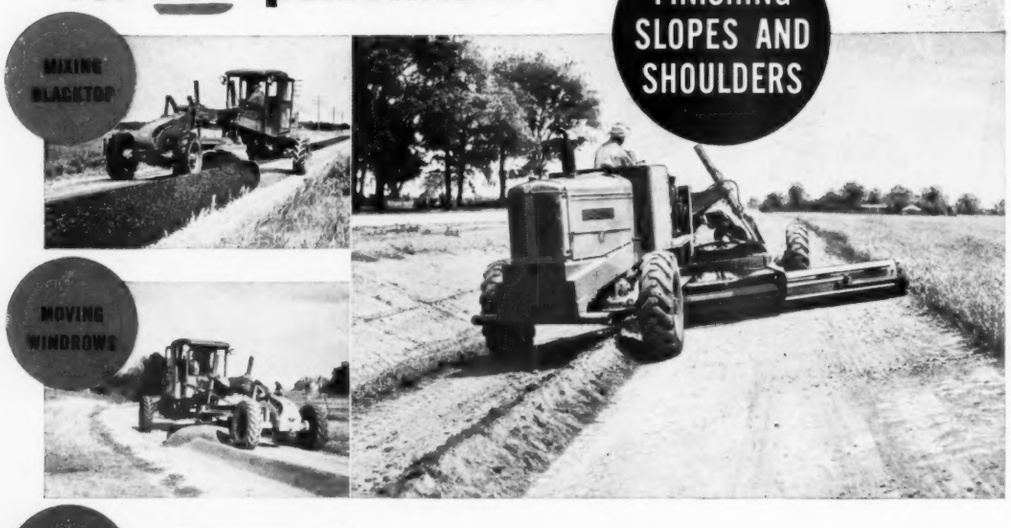
Swing that Rear-End

for TOP performance



Precise finishing operations, not possible with ordinary motor graders, are handled easily and economically by Austin-Western Power Graders with their exclusive All-Wheel Steer. Extra wide shoulders and slopes of any kind can be finished accurately without leaving tire marks. This "extreme blade reach" eliminates a great deal of hand labor—makes quick work of former time-consuming jobs.

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Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

Transmitter-Receiver

Latest addition to the Bendix line of two-way radio equipment is a new FM transmitter-receiver complete with controls, associated power supply, antenna, and microphone mounted in a single housing. The Multi-Master weighs about 50 pounds and operates in the 152 to 174 megacycle band. It can be used as a fixed station or as a mobile unit and may be adapted to narrow-band operation.

The new transmitter-receiver is available in models which operate from 6, 12, and 64-volt dc, or 117-volt ac power sources. There is a choice of either 2, 10, 25, or 35-watt r-f output for either the ac or dc units. A unit providing 60-watt r-f output is available for ac only.

For further information write to Bendix Radio Communications Division, Bendix Aviation Corp., Baltimore 4, Md., or use the Request Card at page 18. Circle No. 425.

Sanitary Landfill Work

Sanitary landfill equipment is shown in a new booklet by Caterpillar Tractor Co., Peoria 8, Ill. Twelve photographs illustrate this disposal method for refuse and garbage. The eight-page booklet tells how cities have developed the sanitary landfill system in cooperation with Federal, state, and local authorities.

The booklet illustrates the equipment necessary for an efficient program. The company particularly invites city officials to send for the booklet.

To obtain this literature write to the company for Bulletin No. 30602, or use the Request Card at page 18. Circle No. 467.

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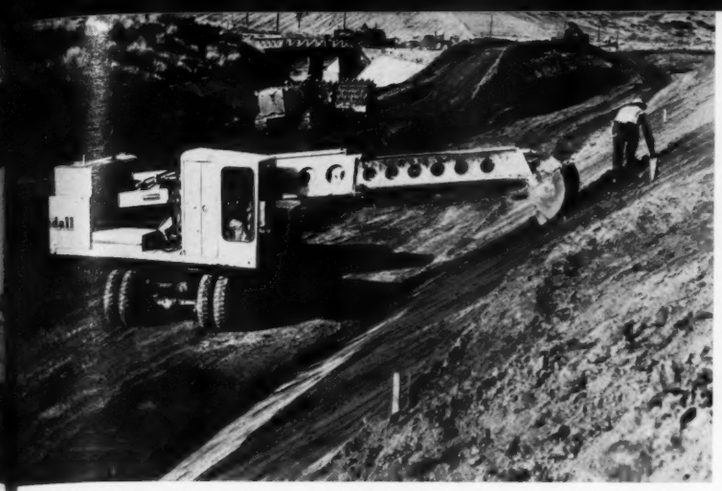
CONCRETE VIBRATORS
MOUNTED ON WHEELBARROW CHASSIS
Write for details and prices
ROETH VIBRATOR CO.
9229 Chestnut Ave., Franklin Park, Ill.



Isabella Dam—Construction of the Isabella Dam in southern California required considerable improving of Boral Canal to insure a continuous supply of water to the hydroelectric power house of the Southern California Edison Co. Macco-Morrison-Knudsen used this Gradall to slope the banks of the Boral Canal.

Puerto Rico Housing—This newly completed housing project in San Juan, Puerto Rico, will provide modern fireproof apartments for 2,600 families. More than 10,000 such units are now under construction on the island. (Note the unusual reinforced-concrete support for the basketball backboard.)

A Creative Profession Described in Pamphlet

A pamphlet entitled "Engineering —A Creative Profession" presents information useful to young men (or women) considering engineering as a career. Short chapters treat such subjects as what an engineer must know, how he is educated, and how he progresses to full responsibility in his work. Other sections are on choosing a college or technical institute, scholarships, achievement and aptitude tests, women in engineering, and industrial fields of activity.

This illustrated pamphlet is available from the Engineers' Council for Professional Development, 29-33 W. 39th St., New York, N. Y. It replaces the Council's previous publication, "Engineering as a Career", and sells in quantities of 50 or more at 20 cents a copy, or singly at 25 cents.

Oil Hydraulic Equipment

Information on Vickers hydraulic vane-type pumps and motors, valves, power steering pumps, and steering booster, is available from M. J. Taup, Manager, Mobile Products Sales, Vickers, Inc., 1492 Oakman Blvd., Detroit 32, Mich.

The booklet is illustrated with sketches which show how the company's equipment is mounted on typical construction machinery. There are also performance curves and specification charts that tell what the equipment may be expected to do. Cut-away drawings indicate the construction features of the various units.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 419.

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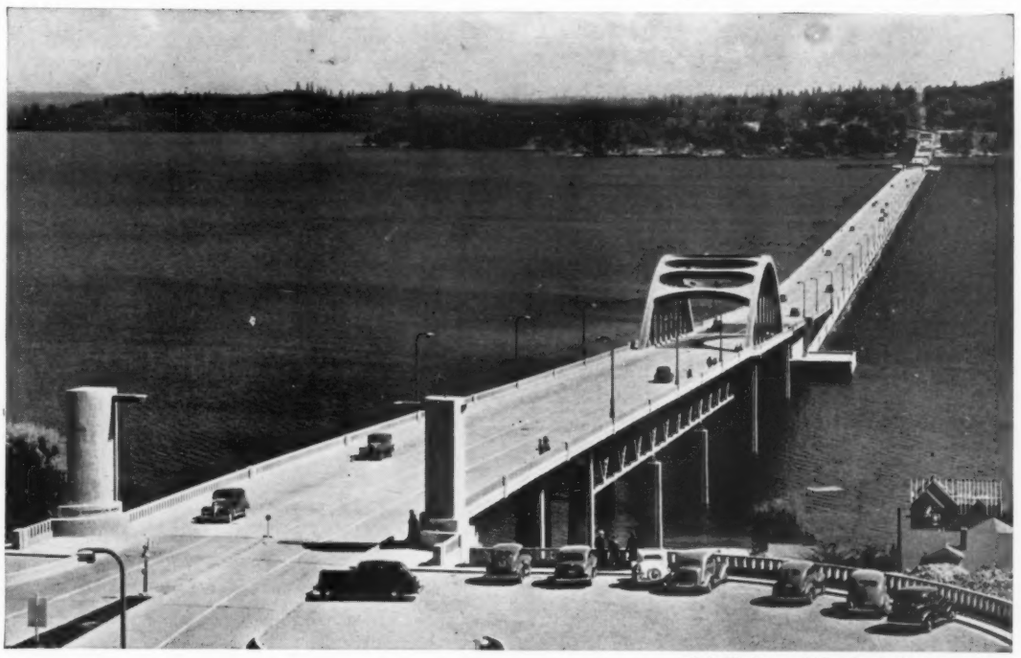
It's a smooth crossing always *on the Lake Washington Bridge*



Lake Washington Bridge, Seattle, Washington

SMOOTH, TIGHT, MAINTENANCE-FREE EXPANSION JOINTS ASSURED BY FLEXCELL* JOINT FILLER

Wherever concrete meets concrete, you can assure joints that *stay* closed and smooth, free of troublesome bulges and crevices, free of expensive maintenance—with Flexcell Bituminous Fibre Expansion Joint Filler!

Flexcell Joint Filler's durable, resilient cane fibre base is the reason. It is filled with millions of tiny air cells. These allow Flexcell to absorb pressure from expanding concrete without extruding, and spring back to keep the joint closed when the concrete contracts. This guards against bulging or opening of the joint—practically eliminates maintenance!

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Flexcell Joint Filler is easy to handle, easy to work with. Provides neat, finished joints without trimming. It is impregnated with asphalt to resist moisture—and protected by the patented Ferox® process against dry rot and termites. Withstands toughest service, severest weather conditions—saves on maintenance year after year. Yet with all this, it is *low in both initial and installed cost!*

Flexcell Joint Filler has long been specified by leading engineers, contractors and architects—as well as the United States Army, Navy and other Federal, State and Municipal agencies. It will pay you to discover the reasons why . . . *before* you start your next job!

Mail coupon below for complete information on the advantages and economies of using Flexcell Joint Filler for pavements, runways, sidewalks, curbs, gutters, driveways, concrete floors. No cost or obligation!

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The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

*Flexcell is a Trademark identifying Bituminous Fibre Expansion Joint Filler marketed by The Celotex Corporation.

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Without obligation, please send me complete data and prices on Flexcell Bituminous Fibre Expansion Joint Filler.

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The Bull Moose, huge rubber-tired tractor bulldozer, for top speed and maneuverability on the job.

New Bulldozer Tractor

A bulldozer tractor weighing 51,300 pounds with attachments has been built by the Cedar Rapids, Iowa, works of the Allis-Chalmers Mfg. Co., Milwaukee, Wis., under a contract with the Engineer Research and Development Laboratories, Fort Belvoir, Va. The machine has been procured for tests, under the supervision of the Corps of Engineers, U. S. Army, which will take place at Fort Belvoir.

The Bull Moose is 11 feet 7½ inches high, and 22 feet 9 inches long, with dozer blade 11 feet wide and 4 feet high, but is said to be highly maneuverable in spite of its size. Special features include a 4-wheel-drive mechanism with front and rear wheels on each side geared together, a semi-automatic transmission and torque converter, and a 4-wheel hydraulic steering system which permits simultaneous or independent control of both sets of front and rear wheels. The machine is equipped with a dozer blade on the front and a cable unit in the rear to operate scrapers.

The unit, powered by a 300-hp diesel engine, is designed to tow a 65,000-pound load at 25 mph, and to operate in temperatures as low as 65 degrees below zero.

Spiral Tunnel-Tubing

Literature is available on a flexible lightweight reinforced-fabric duct used in mine and tunnel ventilation. Spiratube-M is constructed of high-carbon spring-steel wire shaped into continuous helical coils. Coated fabric is spirally wound in overlapping plies around the coils to form tubular sections up to 50-foot single lengths. The coils have a spring action which causes them to extend to and hold their maximum length.

A flexible coupling band is built into each end so that the sections may be joined together.

According to the manufacturer, the tubing may be placed in sharp bends up to 180 degrees without buckling. The contour of the outside perimeter is maintained, and there are no obstructions or kinks to impede the airflow around the curve.

The spiral tubing can be used for either suction or exhaust, and for reversible air systems. Under ordinary fan limits, it will take plus or minus pressure without collapsing.

The literature discusses characteristics of the tubing and gives installation data and specifications.

To obtain this literature write to Flexible Tubing Corp., Guilford, Conn., or use the Request Card at page 18. Circle No. 414.

Fiberglas Safety Headgear

A folder is available on fiberglas safety caps and hats made by E. D. Bullard Co., 275 8th St., San Francisco 3, Calif. According to the manufacturer, the strength-weight ratio of the Hard Boiled hat is greater than that of stainless steel. Other features are resilience, lighter weight, coolness, and fire and water resistance.

The hat comes in white, gray, or 15 other colors and shades. A phosphorescent finish may be molded into the white crown at extra cost.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 410.

P&H Diesel Engines
(2-CYCLE)

Can your diesels match this torque curve?

This is the torque curve for the P&H Model 687-C Diesel Engine. Note how the torque characteristics are sustained throughout its entire horsepower range.

That means steady, responsive power at all speeds — greater lugging "ability" for those toughest jobs. It's the kind of unfaltering performance that assures more profits in any service, constant or intermittent.

Steady torque for steady work is just another outstanding feature of P&H Diesel Engines — America's most advanced line. Ask your P&H Diesel representative for the full story. Or write for literature.

P&H Diesel Engines are built in 1, 2, 3, 4 and 6-cylinder models — up to 145 h.p.

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FAIR HAVEN, MICH.
Use "Messenger" Service

Air-Powered Stapler

An air-driven staple tacker is now in production at The Heller Stapler Co., 2153-E Superior Ave., Cleveland 14, Ohio. A new model with a bumper-type trip is said to drive more than 200 staples per minute and to reduce fatigue to a minimum. The bumper trip distributes 40 to 80-pound air pressure.

The tacker loads a double bar of staples in a variety of metals and finishes, from 5/32 to 13/16 inch long. A spring-lock gate gives the operator easy access without the use of tools.

The Heller Co. makes a line of 27 models of air-driven tackers.

For further information write to the company, or use the Request Card at page 18. Circle No. 385.

New Electrode Holder

An electrode holder said to be cooler and lighter is announced by the Welding Products Division of A. O. Smith Corp., Box 584, Milwaukee 1, Wis. The manufacturer states that there is less tendency for this holder to roll in the operator's hand because the jaw lever is close to the handle. A squeeze of the hand releases the electrode stub. The actuating spring is fully enclosed. Insulated jaws are reversible and can be reconditioned.

The holder is available in 200, 300, and 500-amp sizes.

For further information write to the company, or use the Request Card at page 18. Circle No. 442.

Dravo-Doyle Appointments

C. N. Hollingsworth, formerly acting general manager has been appointed general manager, and John H. Noble, previously assistant sales manager, becomes sales manager of Dravo-Doyle Co., distributor of construction equipment, and wholly owned subsidiary of Dravo Corp., Pittsburgh, Pa.

TWIN PRIME PUMPS

...Better performance ...Lower cost

DUAL VOLUTES, fast priming, non-clogging portable, long lasting centrifugal pumps. Distributors—write for attractive proposition.

Write for details

OHLER MACHINERY CO.

WATERLOO 5 IOWA

A material tower that rolls with the job and operates as a ladder on wheels is made by St. Anthony Machine Products Co., 2424 E. Franklin Ave., Minneapolis, Minn. It consists of a vertical steel frame mounted on two pneumatic rubber tires and equipped with a side-load or wheel-through platform for unloading directly through the hoist structure. Four and 7-cubic-foot automatic dump buckets are available for the Stampco Rol-O-Hoist. For further information write to the company or use the Request Card at page 18. Circle No. 402.

Road-Machinery Line

A line of road machinery is presented in literature from the J. D. Adams Mfg. Co., P. O. Box 853, Indianapolis, Ind. Self-propelled graders catalogued include models ranging from 70 to 100 hp. A weatherproof cab, V-type scarifiers, and snow plows and wings, are among optional equipment offered. All units may be had with big front tires and power steering.

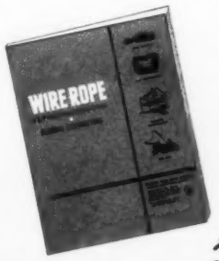
A line of pull-type graders is available with steel or pneumatic-tired wheels.

The booklet also shows the company's Traveloader, a self-propelled, self-feed, belt-type windrow and stockpile loader.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 344.

How You Can Reduce Wire Rope Costs with HAZARD LAY-SET Preformed

• Selecting the correct wire rope for each machine you operate is the most important factor in lengthening rope life and reducing costs. HAZARD has simplified the job by compiling modern *"Wire Rope Recommendations for General Contractors."*



Based on Field Tests—These recommendations are based on thousands of applications carefully watched by HAZARD field men on every conceivable type of equipment you use. You can get the benefit of the successful, and economical, use of LAY-SET "Green Strand" Wire Rope by operators in every field of contracting if you switch to HAZARD.

Every Wire Rope You Need—HAZARD makes all types, grades, and constructions of wire rope in all popular sizes. HAZARD distributors everywhere carry stocks to serve you promptly. Try a HAZARD Wire Rope next time and see the difference it makes.

Ask your HAZARD distributor for a copy of this new 16-page book No. 129-B, or write our Wilkes-Barre, Pa., office today.

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Model PX, Heavy-duty tandem axle, spring mounted platform or float

Model MSO-D, Multiple axle drop bed semi.

Model KS-F, Single axle flat bed semi.

YOU'LL SAVE TIME AND EQUIPMENT . . . with A TRANSPORT TRAILER

14 thru 22-ton capacities . . .

Gooseneck type tilting platform cargo carrier equipped with two double-acting hydraulic cylinders cushion trailer platform when tilted, with or without load. Saves time — saves equipment — one man operation. Exclusive TRANSPORT tandem axle assembly gives both lengthwise and crosswise oscillation.

For Added Service . . .

Single or dual axle TRANSPORT front dollies convert semis to full trailers easily and quickly.

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TRANSPORTATION ENGINEERING A SPECIALTY

CEDAR RAPIDS, IOWA, U.S.A.

It likes the Big Pikes . . .

On the punishing turnpike jobs, original equipment producers know their products will move inches, feet, yards or miles . . . thanks to a Shunk blade.

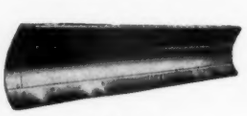
On a big, tough grader, 'dozer or scraper, the Shunk blade really likes the big pikes.

Highway construction and maintenance contractors look to a Shunk blade for endurance and long wear. They specify a Shunk for its superior quality.

Distributors everywhere know that their recommendation of a Shunk blade for turnpike jobs will be backed by Shunk service and reliability.

Put this rugged work horse to work on your next pike job. More information will be gladly provided.

GRADER BLADES



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BUCYRUS, OHIO

Designs Change For Industrial Plants

Box Structures With Climate Control Are Favored as Glass and Masonry Lose Out to Metal Construction

• RECENT trends in industrial plant design indicate that owners favor the 1-story building with a flat-topped box appearance. The trend toward this type is based on a number of considerations. More and more, manufacturers are learning that their products are sensitive to atmospheric conditions. Again, by artificially controlling climate within the plant they create better employee relations and have a satisfied labor force. Finally, the regulation of temperatures results in even heating and cooling distribution at a lower cost to management.

Materials

Another interesting trend in industrial plant design is the reduction of ceramic materials in the construction. Statistics indicate that the use of structural glass as well as masonry is declining.

The large decrease in the use of masonry can be traced to delays caused by the shortages of bricklayers. These delays encouraged the development of various panels made of steel and aluminum, with or without insulation. Designers are constantly discovering that steel and aluminum panels can be erected with great speed, and can be removed and salvaged in case of plant extension.

Though masonry is still being used for the lower 5 or 6 feet of curtain wall, designers are hopeful that substitute materials will be developed. They would welcome some kind of panel sturdy enough to fit this need. Steel and aluminum have firmly established themselves in industrial design, and it is possible that these or other metals will replace masonry in curtain-wall construction.

Uninsulated walls are generally either of some type of metal panel or corrugated cement asbestos. A type of construction which is increasing in plant use is the so-called tilt-up concrete panel, poured in a form on the ground and tilted to a vertical position for a wall.

The choice of roof-deck materials has shown no great change from the practice of the last 20 years. Steel deck, cement tile, gypsum, and wood plank are all in use. Some kind of insulation almost always is installed. There is a need for the development of some material for the acoustical treatment of the underside of roof decks.

Dimensions

The design height of factory buildings has been increased from 14 feet, the once common height, to 18 to 20 feet clear heights. These new heights allow for the installation of monorails, overhead conveyors, and ducts when the plant is built, or when future needs dictate.

Bay dimensions have increased with the trend toward wide column spacing longitudinally, as well as transversely. The old spacings of 20 x 50 feet have increased to sizes of 40 x 60 feet and 60 x 60 feet. Flex-

New Savings In . . .

CONSTRUCTION and MAINTENANCE

Contractors . . . Highway Officials . . . All Say . . .

"CONTRACTION JOINT SAWING IS A MUST!"

- Provides smoother-riding, better appearing surface.
- Reduces quantity of sealing compound used up to 65%.
- Completely eliminates joint spalling and deterioration.
- Permits better sequence of paving operations, at lower cost.
- Inhibits water infiltration and prevents sub-base erosion.
- Makes possible earlier application of curing compounds.

Wedge-type cut eliminates spalling and settling in highway repair and underground services.

Cutting provides superior contraction joints at lower cost . . . permits laying concrete in long sections without interruption.

Floor cutting in industry for machine installation.

Only Tri-Line Gives All These Advantages!

1. Exclusive three-wheel undercarriage prevents tilting, eliminates blade bind and excessive wear.
2. Direct-acting hydraulic control permits quick, effortless depth-of-cut adjustments.
3. Maximum maneuverability afforded by tricycle design. Turns within its own length without jockeying.
4. Sturdy construction means less vibration, less blade wear. A full 700 pounds of ruggedness.
5. Thirty-gallon tank provides water when supply is inconvenient. Can be attached to hydrant if desired.
6. Vital engine parts protected from blade spray. No shut-downs due to engine "drowning."
7. Abundant power from the 13 h.p., two-cylinder Wisconsin air-cooled engine for full-depth, full-speed cutting.
8. Double-ended arbor permits cutting on either side of the machine . . . in places normally inaccessible.
9. Tri-Line blades are double-bonded, scientifically designed for fast, clean-cutting operation.

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Manufactured By

Tri-Line CO.

959 Carroll St. • Racine, Wis.

ibility of operations requires that the pattern of equipment layout shall be restricted as little as possible by the building structure.

Structural frames tend to become heavier, not only because of greater bay sizes, but for flexibility as well. Roof trusses are designed to support overhead conveyors at locations and in weights which may be subject to future changes. Most building services, utilities, and mains of all kinds, are carried overhead for ease of connection. Rigid frames have been the subject of much discussion in recent years. They certainly have their place, but in industrial structures their use is quite limited, mostly to standard buildings with short spans.

The Modern Building

The typical industrial plant for the present will be housed in a structure framed with steel columns, trusses, and purlins. However, the trend toward the ideal factory building is progressing. Functionally, it should have two basic elements—two horizontal planes. One is the floor upon the ground, the other is a plane described by lines of steel—the bottoms of the roof trusses. Between these planes is space, pierced only at wide intervals by the posts which hold the planes apart. Within this space the air and light are regulated as desired.

Upon the lower plane are placed the machines of industry and upon it move the men who operate them. Transportation of materials is on the lower plane or by devices suspended beneath the upper. Extending downward from the upper plane are all kinds of services to meet the needs of the machines. The structure above this upper plane not merely supports a canopy for protection from the weather, but is a vital working servant of the men and machines below. The whole building is designed not only to avoid interference with the process, but in positive ways to serve it.

• *FROM a paper "Recent Trends in Industrial Plant Design" by R. F. Giffels, secretary-treasurer, Giffels & Vallet, Inc., engineers and architects, Detroit, Mich. The paper was presented at the recent fifth annual conference of the American Institute of Steel Construction held in Detroit.*

Wire-Rope Information

A new booklet that recommends types of wire rope to be used with various pieces of construction equipment is offered by the Hazard Wire Rope Division, American Chain & Cable Co., Inc., Wilkes-Barre, Pa.

An explanation of the criteria used in choosing rope appears at the front of the booklet. This includes a discussion of diameter, construction, preformed lay, grade, and core as these terms are applied to wire rope.

Wire-rope recommendations are given for a large number of construction machinery including excavating and earth-moving equipment, cable ways, hoists, mixers and pavers, derricks, drilling machines, pile drivers, and winches.

The machinery discussed is illustrated.

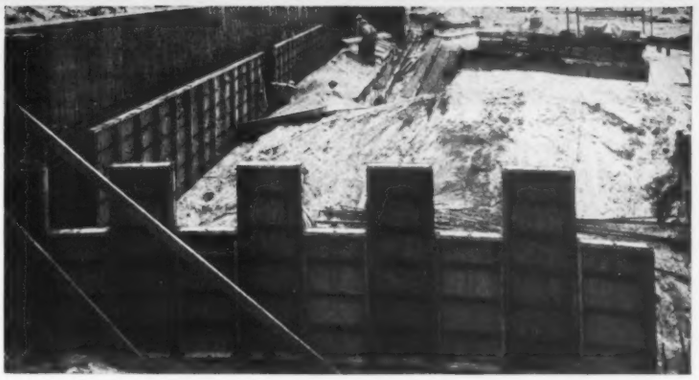
To obtain this literature write to the company and request Bulletin No. 129-B, or use the Request Card that is bound in at page 18. Circle No. 392.

Parts for Dozers, Scrapers

A catalog shows brush-rake attachments that mount on dozer blades for brush clearing. Hensley rake units consist of two shanks fastened together, and come with all parts needed for attaching. The manufacturer recommends that three to five units be used on a standard blade.

Other equipment illustrated includes moldboard rippers for dozers and scrapers, as well as miscellaneous repair parts and end bits for tractors, dozers, and motor graders.

To obtain this literature write to the Hensley Equipment Co., P. O. Box 837, San Leandro, Calif., or use the Request Card at page 18. Circle No. 473.



Alexander Hamilton Memorial, Chicago, Illinois, R. C. Wieboldt, General Contractor

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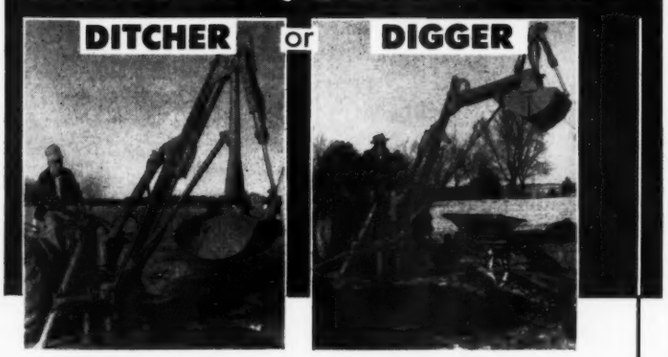

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Easily installed on Ford, Ford-Ferguson and Ferguson tractors.

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SHAWNEE Manufacturing Company, Inc.

1947-M North Topeka, Topeka, Kansas

Portrait in Print

Fred J. Mayo Runs AEC Job

By L. H. HOUCK

• TWO years ago F. H. McGraw & Co. was given a billion dollar contract—at that time the largest construction contract ever awarded to a private contractor—for the Atomic Energy Commission's gaseous diffusion plant in Paducah, Ky. In charge of this assignment as project manager is Fred J. Mayo, a man who began his career as a high-school youngster, working in the roundhouse of the New York & New Haven Railroad.

Fred J. Mayo was born in New Haven, Conn., in 1906, the oldest boy of five children. Since he had three older sisters, the budget was limited for a boy's clothes. When Freddie once picked a higher-priced coat, for which his mother refused to stretch the budget, the 10-year-old Freddie calmly informed her that he would buy his own. When she offered to increase his allowance, Freddie waved her aside and instead began to scurry the neighborhood for jobs. Within a few weeks he had made a payment and soon proudly wore the coat home. Thus, Mayo proved his independence early.

School Days

He finished grammar school at 12, graduated from Hill House High School just under 17, and then studied at Georgetown University, Washington, D. C., from 1924 to 1926. During his school years he worked. He carried a full 8-hour job from 4 to 12 p. m. in the roundhouse of the New York & New Haven Railroad during the last two years of high school. He worked at everything because besides earning money he was determined to accumulate varied and valuable experience. He was a short-order cook, a grocery clerk, a concrete gang laborer, and he felt the sting of hot tar with roofing gangs. He worked as a laborer for the H. C. Horne Co. on its job of remodeling the Yale Bowl.

Fred J. Mayo is in charge of the AEC construction at Paducah, Ky.

Yearning to be an engineer but doubting his ability to master the profession, he gradually became more self-confident by selecting his jobs in the construction field and talking with engineers. Finally convinced that he could master the complexities of the profession, he enrolled at Rennsselaer Polytechnic Institute, Troy, N. Y. The depression hit the country during his last year and there was little demand for junior engineers.

First Engineering Job

Mayo graduated in 1930 and went to work for the New York State Department of Public Works at the Hornell district office as one of three junior engineers in the bridge-design department.

After a few months in the design department Mayo wanted to build a bridge. Accordingly he was sent to the construction division where he was to work under a man known

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Shell Rotella Oil's anti-corrosive action fights one of the chief causes of excessive engine wear—cylinder and piston ring corrosion caused by acidic products of incomplete combustion which occur at low jacket temperatures and with intermittent loads.

And Shell Rotella Oil features extremely effective detergent-dispersant action for reduction of harmful deposits. Drainings in severe service are black—proof that engine deposits are being eliminated in the oil.

If you want the latest information on modern methods of lubrication maintenance—for *any* equipment you operate—write Shell Oil Company, 50 West 50th Street, New York 20, or 100 Bush Street, San Francisco 6, California.

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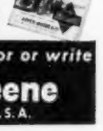

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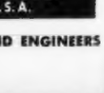

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to be one of the toughest and strictest disciplinarians.

Mayo showed up for the job and asked him what the hours were. The man looked at Mayo and growled:

"All of 'em. Sunup to sundown. See you work 'em."

Mayo was developing a personal method of solving problems and he envisaged this as a situation of learning how to get along with a man hard to get along with.

With this attitude Mayo enjoyed every minute of his job. He knew his responsibilities but he took on more. As job engineer he had charge of quantities, kept costs, laid out work, interpreted plans. He immediately decided to learn more about the job than the superintendent who, he reasoned, couldn't complain if there was no fault to find.

In those days superintendents received 10 times more pay than engineers and wielded greater authority. But at this point Mayo realized that a good superintendent also needs to be a good engineer.

The Depression Hits

During the depression, the department ran out of money and men were laid off. Never afraid of work, Mayo went to a contractor and asked for a job.

"Mayo, what can I do with you?" the contractor asked. "I have no contracts and no place for an engineer."

Mayo told the contractor he had heard that he was planning to rehabilitate an old gravel plant.

"But", the contractor answered, "the only job there is laborer, 30 cents an hour, 10 hours a day."

"You've just hired a laborer," Mayo replied.

Elated with the prospect of income, Mayo reported for work the next morning. The job was to dismantle a gravel plant. Conveyors, screens, and even the crusher were disassembled and overhauled.

Then, one day, the plant was ready to be put together again. This was what Mayo had been waiting for. Knowing he couldn't get more cash and that the foreman couldn't reassemble the plant without help, he proposed to align the conveyor belts, compute proper speeds, and line up the idlers, for extra pay in time off. The result was a week's pay for three day's work.

By the time this job was finished there was no work anywhere—the famous make-work agencies were flowering—and Mayo wandered back home to New Haven where Marc Eidlitz Co. was building the Payne Whitney gymnasium for Yale University. Mayo got a job as an inspector. Later he built some swimming pools and tennis courts, substituted as a school teacher, and then went to work for the Coast Geodedic Survey.

Bermuda Assignment

At that time Haller Engineering Associates, Cambridge, Mass., was helping cities qualify for Federal money grants and Mayo joined the staff. In 1940, Haller was engineering a Reynolds aluminum plant in Alabama which was being built by F. H. McGraw & Co. In 1941, Mayo was tapped by McGraw for project engineer on a job for the Navy in Bermuda where the first contract was a Naval air station. Then came another assignment—dredging the channel for warships. Mayo, his wife, and their daughter, who was born in Bermuda, were there when war broke out.

The main troubles on the channel job were no bottoms and no dredge. It was a joint venture of McGraw & Co. and Purdy Henderson Co. They finally leased a ladder dredge from Marine Industries of Canada and ran it through the U-boat lanes.

This huge 225-ton excavator had forty-five 5-ton buckets. The coral bottom was interlaced with harder rock which caused the buckets to frequently jump the track. To get the chain back on the lower sprockets, native divers went down with diving equipment, consisting of an air mask and telephone. Underwater rigging was supervised by Mayo through a water box.

War duties kept the regular ship lines busy and the company had to find its own bottoms and do its own stevedoring. Soon the toughest roughest crews afloat, flying the flags of little known nations, were bringing in the stuff in picturesque tramps. Of the freighters, only two were torpedoed and one of them was empty. Bad luck was encountered on personnel transports, however, with two torpedoed and men lost.

South America

When this job was finished, Mayo reported to McGraw's New York office and was sent to South America to revitalize the Continental Industrial Development Co., McGraw's wholly owned subsidiary with headquarters in Rio De Janeiro, Brazil. Here the firm joined forces with a Brazilian company, Campania Ferrouiarias Melhoramentos (railroad betterment), to build 30 kilometers of railroad through the Vale Rio Doce jungle from Minasgerais to Vittoria on the Brazil coast.

Machines were unable to compete with native labor. Mayo said natives beat up big rocks with primitive hammers, brought these aggregates to the job in baskets, and sold them cheaper than the material could be machine-produced.

(Concluded on next page)

SPREAD HARSH DRY CONCRETE FAST

BLAW-KNOX CONCRETE PAVING SPREADERS

with the Automatic Transverse Blade

MODERN harsh, dry mixes of 1½" to 3" slump concrete are extremely difficult to spread manually or by makeshift methods with speed and economy. That's why Blaw-Knox Spreaders have become standard equipment in so many high-speed paving operations. This Spreader with the Transverse Blade is the *only* spreader that automatically moves the concrete longitudinally and transversely at the same time, spreading it uniformly to the width and elevation required, no matter where it is placed on the subgrade.

A Vibratory Attachment may be added to compact the concrete simultaneously with the spreading operation, increasing its density and strength and insuring dense pavement edges, free from honeycomb. Blaw-Knox Spreaders easily keep pace with the output of two 34-E pavers.

Available in two standard adjustable widths—10′ to 15′ and 20′ to 25′.

ASSURE A SMOOTH-RIDING FINISH

BLAW-KNOX FINISHING MACHINES

This double-screed pavement finisher assures high daily production and a smooth-riding finish regardless of the type of concrete mix used. Its rigid and sturdy structural frame is combined with proper weight distribution to minimize weaving and lateral thrust on the side forms, even when operating on concrete that is dry, harsh and difficult to manipulate. The large, wide front and rear screed ends prevent wastage of concrete over the side forms. Both standard sizes—10′ to 15′ and 20′ to 25′—are easily and quickly adjustable for width. Screeds are telescopic.

Blaw-Knox Finishing Machines are available with a Vibratory Attachment for consolidating and compacting difficult mixes of concrete, assuring a smooth finish while maintaining maximum production schedules.

MECHANIZE THE ENTIRE JOB FOR...

HIGH-SPEED, LOW-COST CONCRETE PAVING CONSTRUCTION

Mechanization is the key to greater efficiency and economy in modern concrete paving operations. And the key that opens the door to greater profit on *your* job is 100% mechanization with the Blaw-Knox "Complete Package" of concrete construction equipment, developed to bring unified, balanced, "assembly-line" methods to road building operations. The Blaw-Knox "Complete Package" of cost-cutting equipment contains every piece of equipment you need, from forms to finisher, to give you the step-by-step mechanization that assures high-speed, low-cost concrete paving construction.

Blaw-Knox is your *only* source for a completely mechanized outfit . . . a one-responsibility "package" available on one order, in one shipment and with only one financial arrangement. One responsible distributor organization simplifies maintenance and supply of genuine factory replacement parts. One Blaw-Knox trained man can service *all* your "package" equipment. Start mechanizing your paving outfit today to get your share of the big jobs. See your nearest Blaw-Knox distributor for complete details.

USE THE BLAW-KNOX *"Complete Package"* of concrete paving equipment

It includes: Clamshell Buckets • Aggregate and Cement Batching Plants • Steel Road Forms • MultiFoote Concrete Pavers • Precision Subgraders • Concrete Paving Spreaders • Finishing Machines

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Portrait in Print
Of Fred J. Mayo

(Continued from preceding page)

The company also did extensive construction work in Paraguay, including refrigeration plants, silos, and marketing buildings.

Mayo had to leave Paraguay with his last job 90 per cent complete when the revolution came. He never returned and eventually the contract was sold to an English concern.

Assignment China

Mayo's next assignments took him to Holland on a project for the Netherlands-New Guinea Petroleum Co., to Turkey, Greece, and in 1949 to China.

McGraw & Co. had the job of rehabilitating most of China's 8,000 miles of railroad. This was before the Nationalists lost the country to the Communists. Reporting directly to Yu Ta Wei, Minister of Communications for China, Mayo negotiated a contract with him for a railroad survey from Nanking to Shanghai and Shanghai to Hong Kong, in eastern and southeastern China.

In spite of many difficulties, McGraw crews completed their survey but were actually chased out of Communist China by way of Hong Kong. Mayo watched with pleasure the 180-foot pagodas at Canton's western gate fade away, but he had enjoyed every minute of the assignment.

Canada

Home from China, he went to Canada where he reorganized McGraw's Canadian subsidiary, F. H. McGraw Co. of Canada, Ltd., with headquarters in Montreal. Formed originally in 1939, this company had been inactive for several years and was revived in 1949.

Mayo and Canadian McGraw built the Canada & Dominion Sugar Co. storage warehouse, involving sugar handling, warehousing in bulk storage, and processing. The job was primarily a materials-handling problem and when finished, was rated as one of the 10 best industrial jobs of the year.

Atomic Plant

This brings Mayo up to two years ago when he was given the Paducah assignment. McGraw directors placed the project under Mayo's jurisdiction—he is in complete charge and as a vice president speaks for McGraw. He has set up an organization with each man on his staff selected for ability and executive qualities.

One of the biggest problems, according to Mayo, is to keep up the morale of 23,000 persons and to keep them convinced of the importance of their jobs.

Mayo is also a McGraw director, a licensed professional engineer (Conn.), a Kentucky colonel, a member of the Paducah Association of Commerce and of the Canadian Club of New York. He is married to the former Miss Margery Hart of Bridgeport, Conn., and father of three daughters.

Burdened with so much detail and responsibility, Mayo was asked how he could sleep.

"I count sheep," Mayo said, "but only black sheep. I pen 'em up and turn out the lights. Since you can't see black sheep in the dark, I go to sleep."

Drive-Shaft Bearing

A new drive-shaft bearing is announced by Marion Metal Products Co., Marion, Ohio. The new unit is sealed to keep out road dirt and to retain the lubricant. Built around an anti-friction roller bearing, the drive-shaft bearing has a heavy malleable iron-casting body with a steel-adjusting bolt and lubricator.

It will be furnished with all Marion hoists at no increase in cost.

For further information write to the company, or use the Request Card at page 18. Circle No. 345.

Truck-Mounted Hoist

A portable loading hoist for trucks is shown in literature from the Hoist Division of Rushlight's, Inc., 2944 S. E. Powell, Portland 2, Oreg. The hoist is cable-controlled by a remote push-button mechanism. Boom length adjusts from 42 to 60 inches.

Capacity with single cable hook is 500 pounds and with single block 1,000 pounds. The boom rotates 360 degrees.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 458.

DART CRANE CARRIERS

A SOLID FOOTING for ANY RIG!

Special Chassis Available for Any Rigs from 2 Ton to 50 Ton Capacity . . .

The DART Carriers, which for years have been the standard carriers for many well-known manufacturers of cranes and shovels, are available . . . ready for mounting any equipment. Built by the builders of the World's Largest Truck, the DART Carrier is a sturdy, sure footing for any rig.

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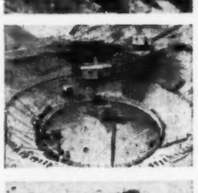

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Convention Calendar

July 12-15 Association of County Officials Meeting, National Association of County Officials, Sheraton Plaza, Boston, Mass. Keith L. Seegmiller, secretary-treasurer, 1616 Eye St. N. W., Washington 6, D. C.

August 17-21 Shade Tree Confere e National Shade Tree Conference, Salle Hotel, Chicago, Ill. L. C. Chadwick secretary-treasurer, Department of Hort ture, Ohio State University, Columbus, C

August 21-23 Seabee Veterans of An Convention, Seabee Veterans of Am Fowler Hotel, Lafayette, Ind. Leonard convention chairman, 1816 E. Main St., Lafayette, Ind.

Eyepiece for Level Has Variable Power

A variable-power eyepiece which eliminates the need for more than one eyepiece for changes of magnification is now a feature of the levels manufactured by W. & L. E. Gurley, Fulton and Station, Troy, N. Y.

The eyepiece permits change from high to low magnification and back again, with stops anywhere in between. It is said to give a clear flat field, devoid of aberrations, at any magnification selected.

The eyepiece offers all the power required for long sighting and reduced power to suit local conditions. Visibility under poor lighting can be improved by use of lower magnification, and the turbulent effect of heat waves rising through the line of sight is minimized with the lower power.

Two eyepiece caps are supplied. One of these has a haze filter, useful for making long sights under adverse conditions.

For further information write to the company, or use the Request Card at page 18. Circle No. 361.

Wheel-Mounted Crane

A new catalog illustrates the self-propelled wheel-mounted Model 20 Wayne crane.

Photographs show construction details including the deck-machinery layout, carrier, boom hoist, transmission, clutch, and the gas or diesel engine.

Complete specifications, operating data, and lifting capacities are included. Data is given for the excavator used with a shovel, trench hoe, clamshell, dragline, and crane.

To obtain this literature write to American Steel Dredge Co., Inc., Wayne Crane Division, P.O. Box 570, Fort Wayne, Ind., or use the Request Card at page 18. Circle No. 424.

David White Plant Opens

David White Co. has opened a new 6-story plant in Milwaukee, Wis., where all the company's surveying instruments and camera manufacturing will be done, giving the firm more than four times the production potential it had a year ago.

The new plant enables David White to expand its production of instruments, and the firm anticipates a greater percentage of its sales from the Instrument Division.

The engineering-instrument and camera firm is the manufacturer of the Stereo-Realist camera.

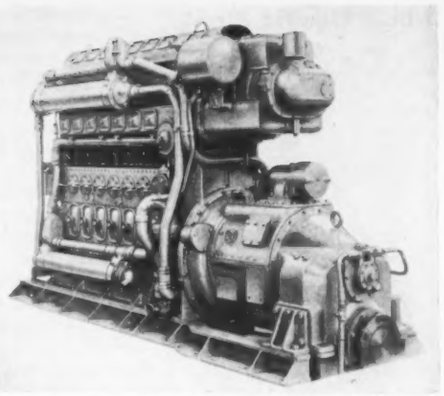
Concrete-Gun Machine

Concrete-gunning equipment is illustrated in literature from the Air Placement Equipment Co., 1011 W. 24th St., Kansas City 8, Mo. The Bondactor guns cementitious aggregates by compressed air. Models of varying capacities operate with 75 to 210-cfm compressors. Concrete gunned with the unit weighs about 170 pounds per cubic foot.

The concrete-gunning machine is offered in a ½ to ¾-cubic-yard model for waterproofing basements from the inside, repairing broken and disintegrated concrete, sandblasting, and making surface application over block, brick, or other masonry. A ¾ to 1½-cubic-yard model and a 1½ to 3-cubic-yard unit are other capacities offered.

The machine is used for waterproofing, concrete restoration, stuccoing, insulation, and fireproofing.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 463.



The new Fairbanks-Morse opposed-piston diesel is designed for heavy-duty applications although it is a fraction of the size and weight of conventional heavy-duty engines. The manufacturer expects the unit to fill needs in the 255 to 750-hp range. For further information write to the Fairbanks-Morse Co., 600 Michigan Ave., Chicago, Ill., or use the Request Card at page 18. Circle No. 477.

A FULL BUCKET at 31 degrees

DROTT
Manufacturing Corp.
Milwaukee 8, Wis.

Backing out of a hole on a 12% grade — but Drott's exclusive roll-back of bucket at ground level (as much as 28 inches) assures a full load every time. When the Drott Skid-Shovel transports material, the loader shoes support the bucket *on the ground*. This keeps the unit in perfect balance and gives the operator excellent visibility.

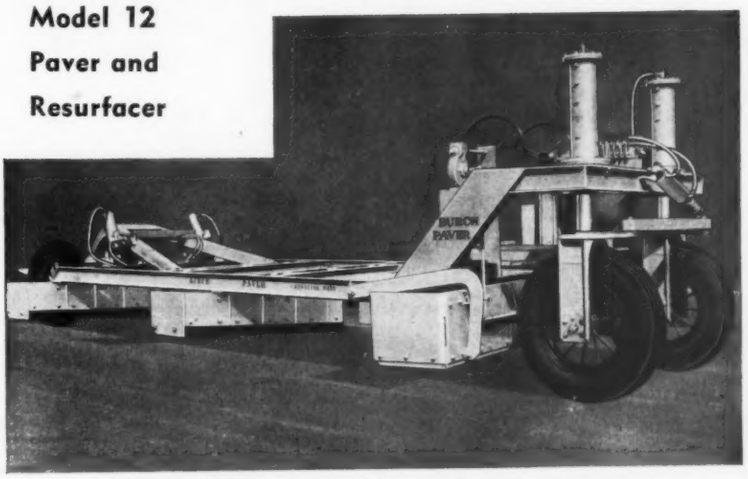
A size for any job — TD-6 TD-9 TD-14A TD-18A

CONTACT YOUR DROTT-INTERNATIONAL DISTRIBUTOR TODAY

BURCH is the BEST BUY!

For ECONOMICAL ROAD BUILDING and MAINTENANCE

Model 12 Paver and Resurfacer



The Model 12 BURCH Paver mixes, spreads, and levels any type of bituminous material 10 to 12 feet wide in ONE operation.

It conforms to any type of grade and easily handles material in ONE pass.

Material is rolled and mixed FOUR times before the strike-off blade acts on it. All main operating adjustments are hydraulically controlled.

FOR COMPLETE INFORMATION WRITE DEPT. CE-73

The BURCH Corporation
CRESTLINE, OHIO, U.S.A.
MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS

Small Electric Plant

A new 1,000-watt electric plant for jobs requiring electric power

generated at the site is announced by Kohler Co., Kohler, Wis.

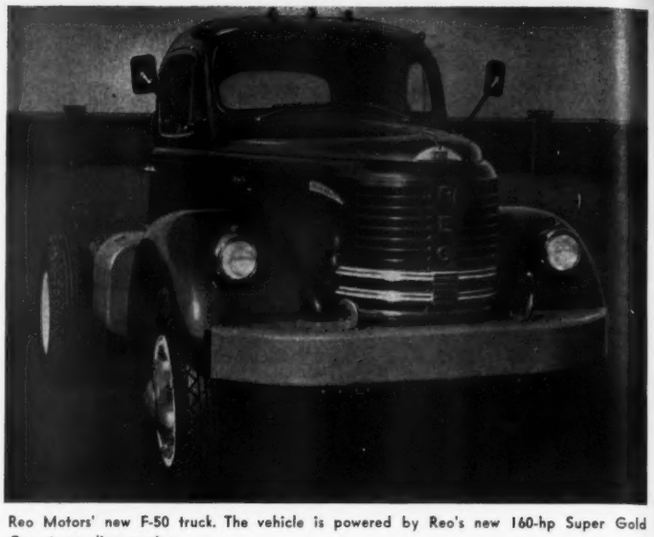
The Model 1A21 starts when a lamp bulb, appliance, or motor connected to the plant is turned on. It automatically stops when all loads are cut off. The plant will operate forty 25-watt bulbs at one time, or various types of power tools.

Other models available are a portable and a push-button unit. Gasoline or natural-gas power is used. Improvements in the new model include the elimination of interference with radio, and better voltage and frequency regulation.

For further information write to the company, or use the Request Card at page 18. Circle No. 347.

Thor Elections

J. A. Hill, who has been with Thor Power Tool Co., Aurora, Ill., for 33 years, has been elected its vice president and sales manager. Also elected vice presidents were John A. McGuire, B. H. Johns, and W. B. Hunn.



Reo Motors' new F-50 truck. The vehicle is powered by Reo's new 160-hp Super Gold Comet gasoline engine.

Heavy Truck Model

A new Reo vehicle has a gross vehicle weight of 26,000 to 28,000 pounds as a truck and a gross combination weight of 50,000 pounds as a tractor. The F-50 truck is powered by a 160-hp Super Gold Comet gasoline engine. It is available in wheelbases ranging from 130 inches to 185 inches. An optional front-end design permits a 102-inch tractor dimension (from front of bumper to rear of cab) for the legal hauling of full 35-foot trailers.

The OH-160 engine powering the unit has a piston displacement of 331 cubic inches and a square 4⅛ x 4⅛-inch bore and stroke. It develops 160-brake hp at a governed rpm of 3,200 and a maximum torque of 290 foot-pounds at 1,400 rpm. Compression ratio is 6.73 to 1. The engine operates on regular octane gasolines.

A Clark 265V, 5-speed, synchromesh transmission, is used with the OH-160. Other features are a new carburetor mounting as well as a new carburetor and intake manifold design. The carburetor is mounted directly on the top face of the intake manifold, providing a full downdraft feed. A new twin-barrel-type carburetor has been designed for this engine.

An oil pump, rated at 11 gpm, a new high-lift camshaft, a distributor, and a deep oil pan are among further features.

For further information write to Reo Motors, Inc., Lansing 20, Mich., or use the Request Card at page 18. Circle No. 371.

Reo Joins Institute

The Industrial and Marine Engine Division of Reo Motors, Inc., Lansing, Mich., has become a member of the Internal Combustion Engine Institute, Chicago 6, Ill. R. D. Jacobs II, head of sales and engineering activities in the division, will be the company's representative at the Institute.

This division of Reo will market engines for a wide variety of stationary and portable uses in the marine and industrial-engine fields.

You can make one of YOUR trucks a combination truck and crane with HYDRA-LIFT!

With a Hydra-Lift mounted on one of your trucks, you have one single compact piece of equipment that loads pipe, hauls it to the job, strings it, then lays it in the ditch; pulls, hauls and strings paving forms, and does countless other jobs much faster and cheaper than ever before. Capacity is 6,400 pounds; hydraulic power swings boom 180°, lifts it 100°; boom telescopes from 12 to 22 feet. Yet Hydra-Lift requires only 40" behind the truck cab—your truck can still haul a normal payload! Investigate this new low-priced truck-crane today!

NOW AVAILABLE — HYDRAULIC OUTRIGGERS!
Raise and lower outriggers instantly by hydraulic power!
Greatly speeds up jobs requiring frequent use of outriggers

PITMAN MANUFACTURING COMPANY
300 West 79th Terrace Kansas City, Missouri

BEARING REPLACEMENT

Simply slip SABECO split thrust washers over the shaft and lock with the safety key!

Provides swift, dependable, economical thrust washer replacement. No costly dismantling necessary. SABECO split thrust washers are made of time-proven SABECO Bronze for long life and top performance on all heavy-duty jobs. Available in any practicable size to your specifications.

Write for further information. Dept. CE

sabeco / SAGINAW BEARING CO.
821 S. Water St. • Saginaw, Michigan

Rear fenders or mudguards on all motor vehicles except dump trucks may become obligatory by law in Wisconsin. A bill requiring them has been sent to the governor for signature.

The new portable sprayer made by Flexible Road Joint Machine Co. The drum holds 55 gallons of concrete-curing compound.

Concrete-Cure Sprayer

A new portable rig for hand-spraying membrane curing compounds on jobs such as sidewalks, walls, small street jobs, and bridge decks is made by Flexible Road Joint Machine Co., Warren, Ohio. It dispenses up to 6 gpm. The unit, which is powered by a 1½-hp engine, holds a 55-gallon drum of compound on its deck. A metering valve controls the spray. A by-pass system returns unused material to the drum and keeps the compound constantly agitated and of the right consistency.

The entire unit, including 55 gallons of compound, weighs 735 pounds, and can be pulled on 4 x 16-inch zero-pressure rubber-tired wheels.

For further information write to the company, or use the Request Card at page 18. Circle No. 474.

Asphalt-Storage Tanks

Storage tanks for asphalt, gasoline, and oil are shown in literature from Sharpsville Steel Fabricators, Inc., Sharpsville, Pa. The company makes underground storage tanks of 550 to 4,000-gallon capacity, and larger units up to 30,000 gallons. Tanks can also be furnished for horizontal and vertical above-ground installation.

All tanks are constructed of soft, open hearth, mild steel; all heads are flanged. Tanks of 5,000-gallon capacity and over have dished heads for added strength. Flanges, manholes, and other openings are furnished to suit requirements.

The company also makes steel saddles and supports for horizontal tanks. The booklet also shows tank accessories, including coil heaters.

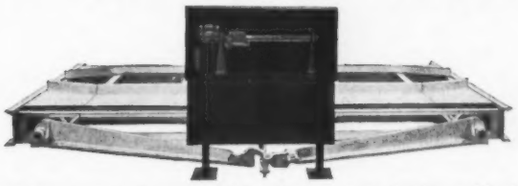
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 421.

Link-Belt Representatives

Rex A. Smith has been promoted to district representative by Link-Belt Speeder Corp., Chicago, Ill., manufacturer of cranes, shovels, and draglines. Operating from headquarters in Cedar Rapids, Iowa, Mr. Smith will assist eight distributors in sales and service in Iowa, Nebraska, Wyoming, eastern Missouri, and southern Illinois.

The new district representative for Texas and Louisiana will be Ralph K. Allen, with headquarters in Dallas, Texas.

WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacities: 15-18-20-30 tons.

Write us for name of your nearest distributor.

WINSLOW SCALE COMPANY
P. O. Box 1198 Terre Haute, Indiana

A TYPE OF
SEAMAN MIXER
FOR EVERY TYPE OF WORK

the **SEAMAN**
SELF-PROPELLED
TRAV-L-PLANT

SEAMAN TRAV-L-PLANT mixing bituminous binder for expressway shoulder. All Seaman Mixers operate up to slab leaving no intervening unmixed material. Bitumen is mixed instantly and thoroughly because TRAV-L-PLANT spray bar applies binder directly into mixing chamber.

The new Heavy Duty Self-Propelled TRAV-L-PLANT pumps 200 G.P.M. of bitumen or water. Tachometer indicates accurate travel in feet per minute; volumetric meter measures rate of flow and gallonage applied to meet changing application requirements in variable soils.

(Below) TRAV-L-PLANT applying 3.17 gal. per sq. yd. in one pass at 50 ft. per minute in sand-asphalt construction.

SEAMAN Self-Propelled MIXER follows asphalt distributor closely to prevent binder migration or surface run-off, important feature of all SEAMAN MIXERS is thorough blending of aggregates and fines to prevent aggregate segregation.

the **SEAMAN**
SELF-PROPELLED
PULVI-MIXER

The SEAMAN Self-Propelled PULVI-MIXER, like all SEAMAN MIXER models, leaves clean, sharp section-end in any type of stabilization. Turns around are quick because of short turning radius.

Send for Bulletin TPS completely illustrating SEAMAN TRAV-L-PLANT and SEAMAN Self-Propelled MIXER. Shows many field scenes. Gives complete specifications. Write today.

SEAMAN Deep Mix Motorized unit mixing for 18 inch (compacted) sand and rock dust base. Note high fluff behind the SEAMAN which indicates exceptional depth. In this case the SEAMAN mixed 30 inches of loose material. SEAMAN Deep Mix unit is recommended for sub-grade stabilization and fill processing. Mixes up to 800 cu. yds. per hour.

the **SEAMAN**
DEEP-MIX
PULVI-MIXER

SEAMAN MOTORS *Inc.*

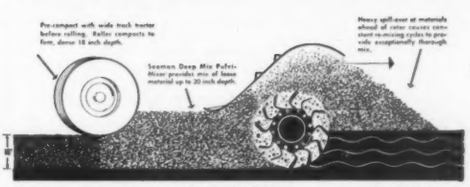


Diagram showing operating depths of SEAMAN Deep Mix unit and movement of materials in mixing chamber. Note heavy spillover ahead of rotor which produces constant re-mixing cycles as the SEAMAN moves ahead.

282 N. 25TH STREET, MILWAUKEE 3, WISCONSIN

Lever Control on Scraper

Details on the new Euclid 15.5-yard scraper are given in a new catalog. The scraper has vertically mounted jacks actuating levers which independently control the bowl, apron, and ejector. This eliminates all cable except a short length used to open the apron.

A simplified hydraulic system has a pump mounted in the supply tank. All four hydraulic jacks are interchangeable.

The cutting edge is in four sections. Each blade is interchangeable and reversible and may be set at various degrees and patterns of overhang for loading in various soil conditions.

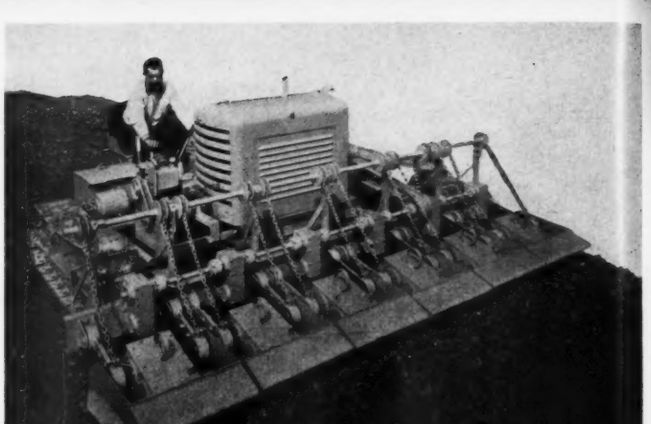
To obtain this literature write to the Euclid Road Machinery Co., 1316 Chardon Road, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 351.

Earthquake Area Film

A new 16-mm sound-and-color film entitled "Earthquakes and Construction", stressing the value of sound design and construction in regions where earthquakes are a probability, has been made available by the West Coast Lumbermen's Association.

The film is a pictorial study of the effects of the numerous earthquake shocks on buildings in Kern County, Calif., during July and August, 1952.

This educational film, with a running time of about 10 minutes, is available free of charge. Bookings can be arranged through the Association, 1410 S. W. Morrison St., Portland 5, Oreg.



The Vibro-Tamper for subbase compaction.

Vibrating Road Tamper Is Crawler-Mounted

A new vibrating-tamping machine can lay the subbase for a road or macadam runway in one operation to a depth of up to 12 inches, according to International Vibration Co., 16702 Waterloo Road, Cleveland 15, Ohio. The Vibro-Tamper compacts in several passes a single 12-inch course to 9 inches compacted thickness of 95 Proctor density. In water-bound work the machine runs screenings in as low as two passes, according to the manufacturer.

The unit is powered by an 85-hp gas engine. Power is supplied to the vibrating-tamping shoes through a V-belt drive from the engine to a 5-section flexibly coupled line shaft. Power takeoff at the shaft consists of an enclosed chain drive for each of the six vibrating shoes. A double V-belt drive transmits power to the oscillating eccentric gearing in each shoe gear box. The intermediate chain drive is said to eliminate belt slippage when the shoes move over uneven ground.

Six 435-pound shoes are used to give the combined vibrating and tamping effect. Total contact area of the six shoes is 18 square feet. Travel rate may be varied from 16 fpm to 1½ mph. The shoes are hydraulically raised to vertical non-operating position for travel off the job.

For further information write to the company, or use the Request Card at page 18. Circle No. 435.

Harnischfeger News

Harnischfeger Corp., Milwaukee, Wis., manufacturer of earth-moving equipment, has been honored for the second time by the Freedoms Foundation. The George Washington Medal was presented by the Foundation's 1952 National Awards Jury in recognition of Harnischfeger's advertising campaign, a public service series.

Harnischfeger news also includes the promotion of Ralph Diehl, former tool superintendent, who becomes works manager of the main plant in Milwaukee and of the repair division in West Allis, Wis. He is succeeded by Robert Over, who was chief tool designer.

The Electric Hoist Division announces the appointment of Curtis Meyer as sales manager. He was recently a director and vice president in charge of sales for Milwaukee Electric Tool Corp., and served on the board of the Electric Tool Institute and on the advisory board of the Portable Tool Industry.

Proven Dependability

1852 VULCAN IRON WORKS CHICAGO·U·S·A 1953

for over 100 years

Manufacturers of Pile Driving Hammers and Pile Extractors

VULCAN IRON WORKS • 329 NORTH BELL AVENUE • CHICAGO 12, ILL.

HEAVY-DUTY TRENCHER

WITH NEW IMPROVED SELF-CLEANING BUCKET — Capacity ½ yd.

A heavy-duty trench digger, which is designed for a wide variety of trenching for any highlift tractor with hydraulic bucket control.

It will increase the tractor's production from 30 to 50 per cent and is easily attached by one man in 15 minutes.

The Whitestown Trencher is now available for use on the following hydraulic controlled tractors:
Allis-Chalmers HD-5G equipped with TS-5 tractor-shovel
Caterpillar D-4 and Trackson HT-4; Oliver with 4-A Lull loader
International TD-6 & TD-9 equipped with new Bucyrus-Erie dozer-shovel
International TD-6, TD-9 & TD-14-A with Hough bulldozer-shovel
Hough Model HM & HR Payloader; Trojan Loadster, Models LM-75; LC-100-B
International TD-9 with Ateco Loader; Pettibone-Mulliken Model 15-D Speedail

The Whitestown trencher is equipped with a ½-yard standard bucket. Special buckets, made to individual specifications, may be obtained. It will dig to a depth of 8 feet and dump at a height of 12 feet. This trencher has been in constant use for four years, and has proved to be rugged and satisfactory in every way.

● *Immediate delivery can be made.*

● *Please specify make of tractor.*

WHITESTOWN TRENCHER CO., INC.

Wood Road, Whitesboro, New York — Phone: Utica 6-2430

HOTEL WISCONSIN

Whether you have a conference, convention, or sales calls in Milwaukee . . . choose the HOTEL WISCONSIN! The service given by the HOTEL WISCONSIN staff from the manager to the bell boy, the comfort afforded our guests by the modern rooms . . . make the HOTEL WISCONSIN the place to stay. At conveniently located HOTEL WISCONSIN you're within walking distance of downtown Milwaukee's offices, shops and theatres.
So . . . make your stop HOTEL WISCONSIN . . .

Your Host
JACK GOODWIN,
Manager

HOTEL WISCONSIN
IN DOWNTOWN MILWAUKEE

Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Govt.'s Change-Order Delay: Contractor's Claim Allowed

THE PROBLEM: *The contractor on a Federal housing project was delayed 175 days through redesigning of a boiler house, under power reserved in the Government to change the work. Forty calendar days should have sufficed. Was the contractor entitled to collect for his job overhead and administrative expenses for the 135 days unnecessarily used?*

THE ANSWER: Yes. (Continental Illinois National Bank & Trust Co. v. United States, 101 Fed. Supp. 755, decided by the United States Court of Claims.)

The court said that the standard contract provision for change orders does not imply that the Government can take its time in considering changes, regardless of the consequences to the contractor.

Delay in Furnishing Site: Contractor Got Damages

THE PROBLEM: *A contract to construct a city water-supply line provided that right-of-ways would be acquired before the contractor began work. But another clause provided that, apart from extensions of time for performance on account of unavoidable delays, no allowance would be made for any hindrance or delay from any cause, whether avoidable or unavoidable. The work was to be completed within 150 days, but there was a delay of 182 days because the city had not procured certain right-of-ways. Was the contractor entitled to damages measured by the expense resulting from standing by and thus, at increased cost, extending the work into the winter months?*

THE ANSWER: Yes. (McGuire & Hester v. City and County of San Francisco, 247 Pac. 2d 934, decided by the California District Court of Appeal, First District.)

The decision was reached after considering numerous contract clauses, which the court noted must be interpreted in favor of the contractor on doubtful points. The general rule of law is that ambiguities in contracts are to be settled against the party wording the contract—in this case, the City.

The court said that it would give the contract unreasonable meaning to read it as providing that the City could break its "solemn agreement" to secure right-of-ways in advance, and leave the contractor with no right other than to an extension of time to finish the job. This was particularly so, where the delay involved completion under extremely adverse weather conditions.

The court differentiated the case from one where a contract expressly provided that an extension of time would be the contractor's only right on being delayed "by the acts or neglect of the owner" (Hansen v. Cevell, 24 Pac. 2d 772, decided by the California Supreme Court) and a Maryland case where a contract explicitly said that an extension of time for performance should be the contractor's only remedy on being delayed through a city's failure to secure title to a site (Christhilf v. Mayor and City Council, 136 Atl. 527). The court thought that a more pertinent case in point was one decided by the Minnesota Supreme Court, to the effect that a clause requiring a contractor to follow certain procedure for a desired extension of time if delayed by "any cause whatever" meant any cause other than act of the City. (Hill v. City of Duluth, 58 N. W. 992.)

The court cited another case where the California District Court of Appeal at Los Angeles overruled the City's claim that, under the wording of a contract there involved, allowance of extra time for performance was the contractor's only recourse when delayed by the City's inability to furnish materials on time. In that case the court said that to uphold such a contention would give the City "an unconscionable advantage over the contractor, by permitting him to make amends for its contractual derelictions, delays, and neglect by simply extending the time within which the contract could be completed regardless of the financial loss accruing to the contractor". This the court could not do in the absence of a plain unequivocal intention on the part of the contracting parties.

In the principal case here under discussion, the District Court of Appeal said that the City's liability for damages resulting to the contractor

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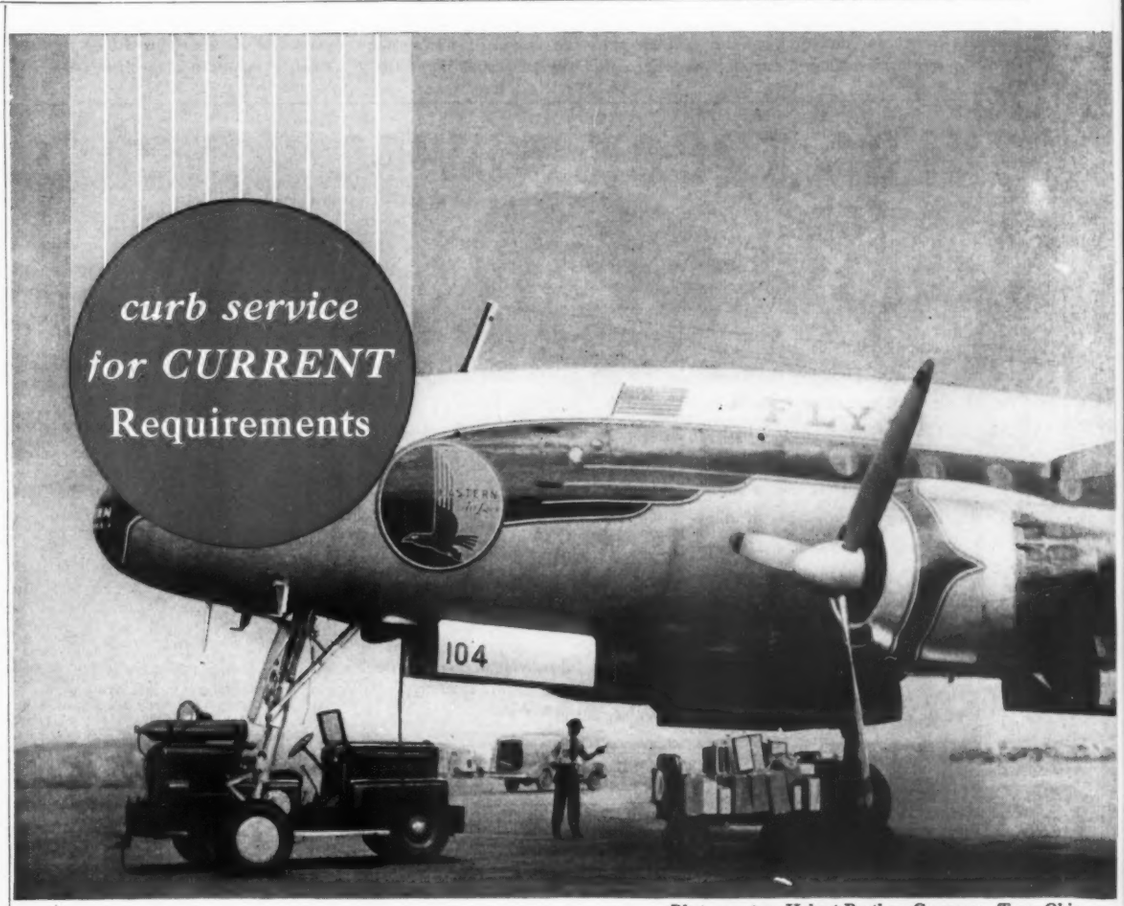
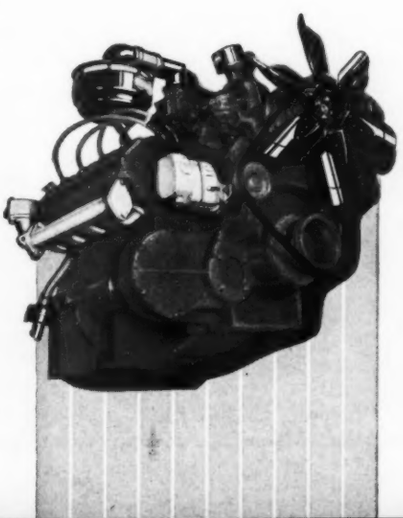


Photo courtesy Hobart Brothers Company, Troy, Ohio

Chrysler horsepower on the ground for added Safety in the Air . . .



The moment the big plane stops and the pilot cuts the engines, the generators, which in flight supply electrical power to the batteries, stop too. But the electrical equipment in the plane—air conditioning, lights, radio, food containers, everything electrical—continue operating off the plane's batteries. Only for a moment, however. In that length of time a self-propelled and self-powered energizer takes over and supplies all necessary current, even starting the plane's engines when it's time to leave.

Among the most popular mobile ground power units are the "Power-Pull" units manufactured by Hobart and powered by Chrysler. The unit pictured uses the mighty 180 horsepower Chrysler V-8 Industrial Engine and can furnish 1000 amperes, 28.5 volts of direct current under continuous operation—enough to handle the electrical load of the largest aircraft. Power from the same engine propels the unit, enabling it to serve also as a towing tractor.

This is another in the long list of important uses of Chrysler Industrial Power. Whether your equipment requires V-8 or Six cylinder engines, Chrysler can supply them with gasoline, propane or natural gas burning carburetor, 3, 4 or 5-speed transmission and other optional equipment.

For your power needs, see a Chrysler Industrial Engine Dealer, or write: ***Dept. 87, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

CHRYSLER
Industrial Engines
HORSEPOWER WITH A PEDIGREE

included the increased expense of completing the work in unseasonable weather, as well as the loss caused by the contractor having to stand by until the whole site was secured.

The court further rejected the city's contention that when the contractor, for lack of a site, was compelled to suspend work, he should have quit the job and relied on a suit for damages for breach of contract. This would have lessened the damages for which the City would be liable. The court noted that the City's engineer had led the contractor to believe that the right-of-ways would soon be secured, and that the contractor had done all he could to minimize standby expense.

Court Enjoined Union From An Interference

THE PROBLEM: *Labor unions interfered with the performance of important county construction, to the detriment of the public, by instructing union members not to load or deliver materials for the county or its employees or contractors. Under New York statutes, was the county entitled to a temporary injunction against the unions for such interference?*

THE ANSWER: Yes. (Westchester County v. Westchester County Federation of Labor, 115 N. Y. Supp. 2d 144, decided by the New York Supreme Court, Special Term, Westchester County.)

First, the court decided that unions are protected against injunction where there is an actual labor dispute involved. "One-sided contention alone does not make a dispute."

Second, the statutory restraint against injunction does not apply to counties or other political subdivisions of the state. "The common good and the very survival of good government depends upon the unrestrained power of the courts to act promptly where the interests of the public are involved."

Concealment of Boring Made Government Liable

THE PROBLEM: *Before inviting bids on an airport-construction job, United States engineers made core borings all over the site. The results were recorded in boring-log field books, but were not correctly recorded on data furnished to the bidders, nor in the specifications. In one area drilling ceased when the engineers' equipment could not penetrate underlying blue granite, but the data furnished to bidders indicated underlying sandstone. (1) Was the contractor entitled to damages? (2) Was the Government entitled to the benefit of provisions of the contract applicable to discovery of unknown subsurface conditions? (3) Was the contractor chargeable with damages for delayed completion largely due to the misrepresented conditions?*

THE ANSWERS: (1) Yes. (2) No. (3) No. (Potashnick v. United States, 105 Fed. Supp. 837, decided by the United States Court of Claims.)

The court declared that the bidding data constituted a warranty against the subterranean conditions encountered, and that plaintiff, the contractor, was entitled to $119,062.50 damages. Article 4 of the contract, concerning "Changed Conditions", applied only to conditions unknown to both the Government and the contractor. For the same reason, it was decided that a clause, which required an appeal to be taken within 30 days from the contracting officer's denial of an extension of time for performance, did not apply.

Insolvent Contractor's Fraudulent Transfers

THE PROBLEM: *A contractor made a false statement as to his financial condition to induce a surety company to secure performance bonds given by the contractor on construction jobs. Later, when he learned that claims which he was bound to pay had been filed with the company, the contractor transferred his interests in real estate and corporate stock to his wife, without consideration. She knew that he did this with intent to protect it against claims of his creditors. (1) Was the transfer voidable as against the surety company's claim for reimbursement of the claims it had to pay? (2) After the surety company sued to set the transfers aside, the Federal government filed a tax lien against the contractor's property. Did the lien have priority over the surety's claim?*

THE ANSWERS: (1) Yes. (2) No. (Federal & Deposit Co. of Maryland v. Lovell, 108 Fed. Supp. 360, decided by the United States District Court, Southern District of Mississippi, Jackson Division.)

The court noted that delay in recording the deed to the wife was one circumstance indicating fraudulent intent.

As to priorities between the company and the Government, the court said that they stood upon an equal basis, but that the surety gained priority by being the first to take steps to annul the fraudulent transfers.

No Competitive Bidding: Contract Not Invalidated

THE PROBLEM: *The plans and specifications for a municipal incinerator called for the use of a patented device. Where bids based on the use of competitive devices were recognized, was the contract invalidated on a theory of lack of competitive bidding?*

THE ANSWER: No. (Hinds v. State, 59 So. 2d 634, decided by the Florida Supreme Court.)

TULSA TRUCK POWER WINCHES FOR LOADING

in construction, oil fields, public utilities and commercial hauling, the favorite time and labor saver is a Tulsa Winch. Literally hundreds of heavy and difficult jobs can be handled quickly, easily and safely with a Tulsa Winch. Heavily constructed of the finest materials, Tulsa Winches pay for themselves every day through untroubled performance. Equip your trucks and crawler tractors NOW with Tulsa Winches.

Tulsa Winch-equipped truck used by a public utility company shown loading 3-ton cable reels with a Model 23 Tulsa Winch.

Tulsa* Winch
TULSA, OKLAHOMA DIVISION OF VICKERS Inc.
*Reg. U. S. Pat. Off.

MC BIN BATCHER-MIXERS
An Unbeatable Combination

Whether used for charging an individual 11S or 16S Mixer, or a pair as shown, a Bin-Batcher is the short cut to profit. Enables you to take the advantages of a central plant right onto any job. Several models. Ask for details.

CONSTRUCTION MACHINERY COMPANIES Waterloo, Ia.

Proposal Terms Controlled Clause in Final Contract

THE PROBLEM: *A subcontractor's proposal to install a municipal water pipeline in an oil-mat-surfaced street covered "all labor and equipment except for the repair of the oil-mat street", and included replacement of concrete and asphalt pavement which would be broken at paved street crossings. The contract called for laying the main according to the prime-contract specifications and required the subcontractor to furnish concrete to replace and repair any broken pavement. One of the specifications required restoration of all paving, oil-mat or other street surfacing, etc. Was it the prime contractor's duty to restore the oil-mat surface under which the main was laid, which would entitle the subcontractor to reimbursement on his being required to do that work?*

THE ANSWER: Yes. (Paine-Gallucci, Inc. v. Anderson, 246 Pac. 2d 1095, decided by the Washington Supreme Court.)

The court applied a rule of law followed by all courts throughout the country, that related documents may be read together and as an entirety in arriving at the mutual intention of the parties.

Claims for Idling Equipment Because of Delays

THE PROBLEM: *A contractor's equipment on a Federal job is idled through a delay in performance chargeable to the Government. What is a fair basis for compensating the contractor on that item of damages?*

THE ANSWER: The fair rental value of the equipment during the period of delay, reduced by 50 per cent to compensate for absence of wear and tear. (Warren Bros. Roads Co. v. United States, 105 Fed. Supp. 826, decided by the United States Court of Claims.)

The court cited several of its former decisions as having previously established that formula for measuring damages. As to this case, decided in 1952, the court said that a 50 per cent deduction was especially proper "in order to eliminate also the element of 'profit to the lessor' contained in the Office of Price Administration maximum rental rates".

Contractor Not Liable to Subcontractor's Man

THE PROBLEM: *A highway contractor sublet the watering and sodding of shoulders. The subcontractor's employee was struck by an automobile while assisting in operating a sprinkling truck on the left side of the highway. The work having been under sole control of the subcontractor, was the prime contractor liable?*

THE ANSWER: No. (Lancaster v. Lancaster, 57 So. 2d 302, decided by the Mississippi Supreme Court.)

Owner Had Right To Change Plans

THE PROBLEM: *When a building contract was made—the contractor to be paid a percentage of the cost—the cost was estimated at $50,000 to $65,000. But the contract specified that, without invalidating the agreement, the owners could "order extra work or make changes by adding to the work; it being understoood . . . that contract percentages as to payments shall be the same". There was then only a pencil sketch of the building. Work began before the plans were completed. Architects estimated the cost at $160,000 to $180,000 when they saw the plans. Did the increased estimated cost release the contractor on the ground that the owners virtually abandoned the contract?*

THE ANSWER: No. (Oliver L. Taetz, Inc. v. Groff, 253 S.W. 2d 824, decided by the Missouri Supreme Court.)

The court reasoned that the quoted clause of the contract gave the owners broad power to change the original building plan, particularly since the contractor was not prejudiced, his pay being computed on a cost basis. Furthermore, the contractor, by completing the building under the final plans, was deprived of the right to complain.

Federal Wage Law

THE PROBLEM: *The Edsel Ford Expressway constitutes a new highway lying wholly within Detroit, constructed at State-City-County-Federal expense. It constitutes a link in interstate traffic. Were employees engaged on the project entitled to the benefits of the overtime-pay provisions of the Federal Fair Labor Standards Act?*

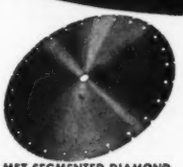
THE ANSWER: No. (Koepfle v. Garavaglia, 200 Fed. 2d 191, decided by the United States Court of Appeals, Sixth Circuit.)

Because this was a new and independent highway, although linked with interstate highways, the court distinguished the case from cases where the Federal law has been declared to apply to repair or improvement of pre-existing interstate facilities, such as dikes and revetments along the Mississippi River and a bridge replacing an old one on an interstate highway.

LeTourneau Moves HQ

R. G. LeTourneau, Inc., announces that its headquarters, formerly located at Peoria, Ill., have been transferred to Longview, Texas. The company's earth-moving equipment interests have been transferred to LeTourneau-Westinghouse.

A New 13.5 h.p.
CONCRETE CUTTER
for only $580.00
Net f.o.b. factory



DI-MET SEGMENTED DIAMOND WHEEL—Available in two types: STANDARD for hard, dense, cured concrete. SPECIAL for green, uncured concrete and asphalt.

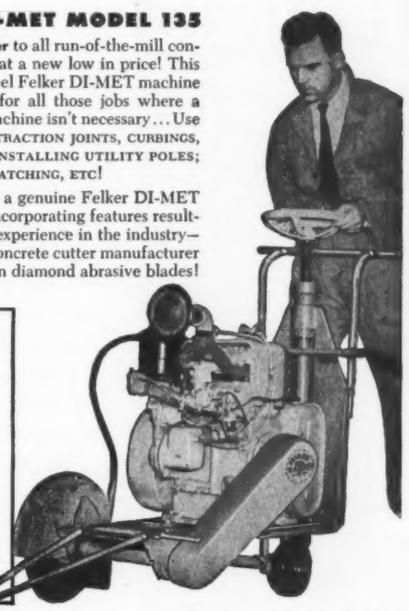
FEATURES

EASY HANDLING—3 wheel design with light-weight alloy castings.
BIG BLADE CAPACITY—Utilizes from 8" to 18" diamond wheels. Cuts to 3½" depth with 12" wheel.
SPLIT, HINGED BLADE GUARD—For cutting close to curbs, etc. 12" standard, 18" optional equipment.
POWERFUL ENGINE—Full 13½ h.p. Wisconsin Model TF gives a surplus of power for every cutting requirement.
PRESSURE COOLANT supplied through external hose connections.
INSTANT BLADE DEPTH ADJUSTMENT with hand-wheel and screw.
SLOTTED BLADE COLLARS—Powerful coolant ejection completely flushes blade and kerf.
HUSKY SPINDLE—Mounted in Dodge S.C. self-aligning ball bearing pillow blocks. 1¾" single end arbor with keyway.

FELKER DI-MET MODEL 135

Here's your answer to all run-of-the-mill concrete cutting jobs at a new low in price! This light-weight 3 wheel Felker DI-MET machine is specially built for all those jobs where a big heavy-duty machine isn't necessary... Use it for cutting CONTRACTION JOINTS, CURBINGS, DRIVEWAYS; FOR INSTALLING UTILITY POLES; FOR TRENCHING, PATCHING, ETC!

Now you can own a genuine Felker DI-MET Concrete Cutter incorporating features resulting from years of experience in the industry—built by the *only* concrete cutter manufacturer who makes his own diamond abrasive blades!



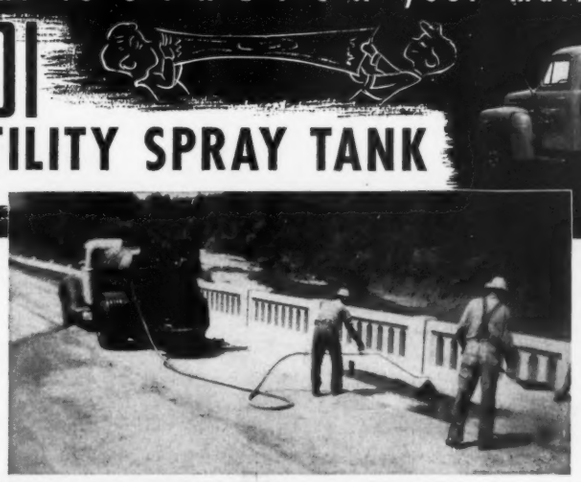
Get ALL the facts on the LOW-COST DI-MET MODEL *135. See your dealer or write us today!*

FELKER DI-MET

FELKER MANUFACTURING CO.
Torrance, California
World's Largest Manufacturer of Diamond Abrasive Cut-Off Wheels and Equipment

Want to S-T-R-E-T-C-H your maintenance dollar?

101 UTILITY SPRAY TANK



You'll need a 101 Utility Spray Tank to do it! Because here's a combination of 3 Units all done up in one package. The Model 101 is designed to give Highway Departments and Contractors a Utility unit that will do a variety of road maintenance jobs economically. The 101 Utility Spray Tank has a Spray Bar for small application work, Hand Spray Attachment for patch work and Pouring Pot Outlet for crack filling work. This 101 Utility unit will handle Asphalt, Tar Emulsion, Road Oil and Cut-Back. Has a fast heating system with Vaporizing Torch Type Burners. The 101 is made in both Truck Mounted and Trailer Mounted Models, sizes ranging from 400 to 1000 gallons. If you want your maintenance dollar to stretch here's the unit for the job. For further details write for Bulletin No. 5.

BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE - 1900
LB LITTLEFORD
LITTLEFORD BROS., INC.
485 E. Pearl St. • Cincinnati 2, Ohio

Distributor Doings

Repair Depot Opened By Midwestern

A modern industrial equipment and overhauling department has been activated by the Midwestern Engine & Equipment Co., Inc., Tulsa, Okla. It will furnish routine and emergency repair and parts work on construction and oil-field equipment.

The new $200,000 home office and shop facilities are located at 4645 Sapulpa Road on U. S. 66, just west of Tulsa. By the addition, Midwestern becomes one of the largest equipment-repair companies in the southwest. The company will also provide airplane service for rushing parts and mechanics for emergency repair work in the field. Repairing and overhauling will be done on all makes of engines and equipment.

The shop has three large repair bays with access from the yard through four overhead doors 12 feet wide x 16 feet high. An area for engine and small-equipment repairs adjoins the heavy-equipment shop. At the loading dock a hydraulic lift handles heavy equipment and supplies directly from the bed of the delivery truck. Midwestern also has a storage building for incoming and outgoing equipment. A large open area is available to customers for storing their equipment.

Midwestern's new location is accessible to good highway and railway routes. Large floats of heavy equipment can be pulled into the repair depot without traffic hazard or difficulty. In addition, the company is served by its own rail spur tying into both the Sapulpa and Frisco lines.

Armon H. Bost, vice president and general manager, announced the appointment of William K. McKenzie to head the equipment-repair division. Other appointments are W. F. Winkler as equipment sales manager and Norris E. Cott as purchasing agent-sales coordinator.

Koehring Dealers Named

Koehring Co., Milwaukee, Wis., manufacturer of heavy-duty equipment, announces the appointment of Ray C. Call Co., South Charleston, W. Va., as distributor for West Virginia. The company, of which Everett C. Call is manager, will handle the complete line of Koehring products as well as equipment from the three Koehring subsidiaries: Parsons Co., Newton, Iowa; C. S. Johnson Co., Champaign, Ill.; and Kwik-Mix Co., Port Washington, Wis.

It was also announced that E. J. Hartlein is to be the company's district representative for the northwest sales territory, including Iowa, Kansas, Minnesota, Nebraska, North Dakota, and South Dakota. He succeeds Jack Miller, who retired this year.

New Shack Cards

An improved shack card is being provided to contractors in nearby areas by Paving Supply & Equipment Co., Washington, D. C., and Baltimore, Md. Designed to meet the needs of modern construction both in time saving and convenience, the shack card is large enough to list all telephone numbers used regularly on the job. There are printed alphabetical listings, ample space for writing with a carpenter's thick pencil, as well as spaces for weather, emergency, fire, police, and medical telephone numbers.

The card is available free of charge upon request from established contractors engaged in construction jobs in the areas served by Paving Supply & Equipment Co., including the District of Columbia, Maryland, five counties in Virginia, and three southern counties in Delaware.

Stillwell to Have Branch

Stillwell Equipment Corp., with Long Island City, N. Y., headquarters, has prepared construction plans for a warehouse, offices, and showroom on Tarrytown Road, Elmsford, N. Y.

The branch, whose opening is scheduled for September 1, 1953, will serve Westchester, Putnam, Dutchess, Orange, and Rockland counties, N. Y., and southern Connecticut. Stillwell distributes Vibro Plus, Broderick & Bascom, Muller, CMC, Whiteman, Haiss, Mar-Rail, C. H. & E., and other lines.

Symons Co. Grants License

Symons Clamp & Manufacturing Co., Chicago, Ill., announces that Concrete Forms, Inc., Portland, Oreg., has been granted exclusive rights for assembly, sale, and rental of the Symons forming system in the Pacific northwest. Concrete Forms, Inc., will supply the Symons forming system through dealer agents in Idaho, Montana, Oregon, Washington, Alaska, and western Canada.

HEILINERS

Reduce Maintenance Downtime and Costs

. . . and that's where you make money on earth moving, with a machine that spends more hours on the job moving dirt. Heiliners are designed for easy, time-saving maintenance, and remember, wherever you're working, your nearby Heiliner distributor is ready to serve you with genuine Heiliner parts and the expert service of factory-trained field mechanics

NO NEED TO PULL WHEELS TO REPLACE AXLE

Just take off the hub cap to replace the axle shaft or adjust the final drive! No shoring or crane is ever required and best of all one man can do the job without any special training.

REPLACE PCU CLUTCH CONE IN 15 MINUTES

Heiliner single speed control unit is readily accessible for easy servicing with no complicated housing to remove. Large drums run cool, cable lasts longer, costs are lower. Cover which protects the drums, on hinges to give full cable accessibility.

ALL PARTS EASILY ACCESSIBLE

Due to Heil automotive-type design, all operating components are simple and easy to service.

THE HEIL CO.

DEPT 373, 3003 WEST MONTANA ST.
MILWAUKEE 1, WISCONSIN

Factories: Milwaukee, Wis.—Hillside, N. J.

Sales Offices: New York, Union, N. J., Washington, D. C., Atlanta, Cleveland, Milwaukee, Detroit, Chicago, Kansas City, Denver, Dallas, Los Angeles, Seattle; Rio de Janeiro, Brazil.

HOW HEILINER DESIGN SIMPLIFIES MAINTENANCE

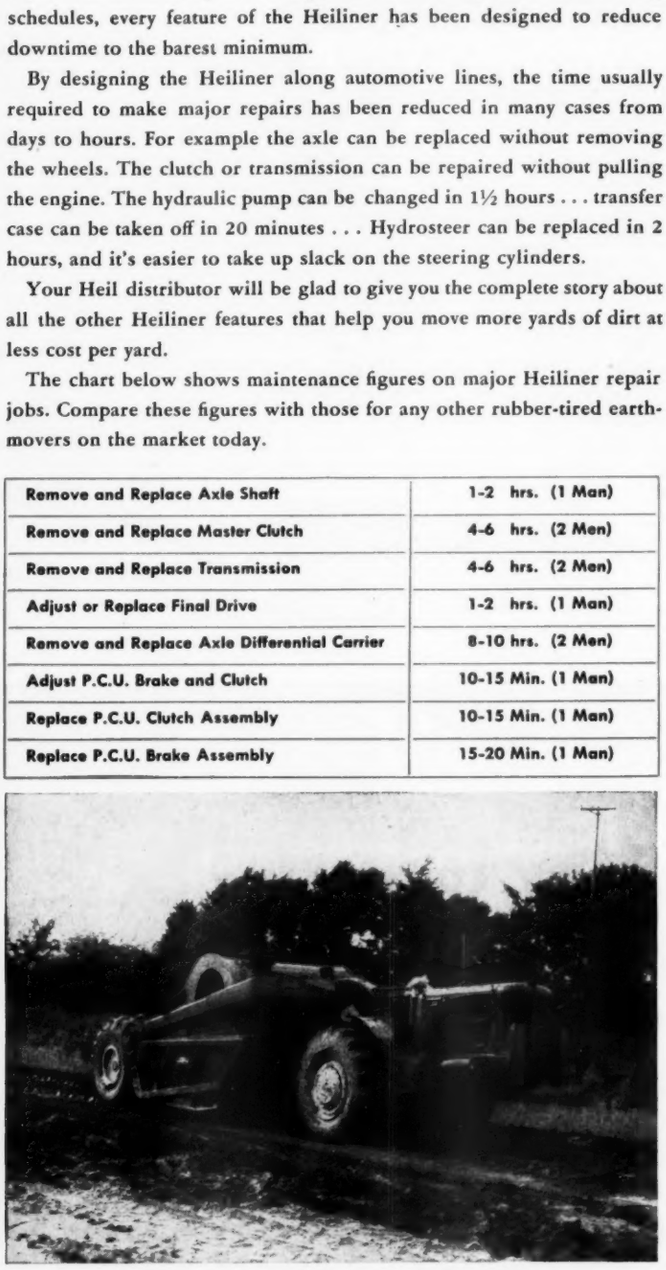
WITH "time on the job" so important in working close earthmoving schedules, every feature of the Heiliner has been designed to reduce downtime to the barest minimum.

By designing the Heiliner along automotive lines, the time usually required to make major repairs has been reduced in many cases from days to hours. For example the axle can be replaced without removing the wheels. The clutch or transmission can be repaired without pulling the engine. The hydraulic pump can be changed in 1½ hours . . . transfer case can be taken off in 20 minutes . . . Hydrosteer can be replaced in 2 hours, and it's easier to take up slack on the steering cylinders.

Your Heil distributor will be glad to give you the complete story about all the other Heiliner features that help you move more yards of dirt at less cost per yard.

The chart below shows maintenance figures on major Heiliner repair jobs. Compare these figures with those for any other rubber-tired earthmovers on the market today.

Remove and Replace Axle Shaft	1-2 hrs. (1 Man)
Remove and Replace Master Clutch	4-6 hrs. (2 Men)
Remove and Replace Transmission	4-6 hrs. (2 Men)
Adjust or Replace Final Drive	1-2 hrs. (1 Man)
Remove and Replace Axle Differential Carrier	8-10 hrs. (2 Men)
Adjust P.C.U. Brake and Clutch	10-15 Min. (1 Man)
Replace P.C.U. Clutch Assembly	10-15 Min. (1 Man)
Replace P.C.U. Brake Assembly	15-20 Min. (1 Man)



Heiliners spend more time on the job . . . less in the shop . . . to keep earthmoving projects moving at a schedule-clipping pace.

Distributor Doings

State Equipment Promotes

Robert F. Chidsey has been promoted from assistant manager to sales representative by State Equipment Co., Harrisburg, Pa. Mr. Chidsey will serve users of heavy construction equipment in the Pennsylvania counties of Dauphin, Cumberland, and Perry.

State Equipment Co. machinery includes International tractors and industrial power units, Bucyrus-Erie tractor equipment, Adams motor graders, Hough Payloaders, Link-Belt excavators and cranes, Heil earth-movers, Hughes trailers, and Challenge mixers.

Euclid Subsidiary Firm

Euclid Road Machinery Co., Cleveland, Ohio, has established a new subsidiary firm, to be known as Euclid-Arkansas, Inc., with headquarters at 702 W. 2nd St., North Little Rock, Ark. The new firm will provide sales and service for Euclid owners throughout Arkansas with the exception of six counties directly opposite Memphis (Mississippi, Cross, St. Francis, Lee, Phillips, and Crittenden counties).

President will be R. A. Trippeer; other members of the staff will include J. C. Mitchell, R. T. Vawter, R. M. Greer, Worthington Brown, and Dan Carragher.

Bucyrus-Erie Distributor

General Equipment, Inc., with headquarters at 435 Richland Ave., P. O. Box 266, Baton Rouge, La., has been appointed as a Bucyrus-Erie distributor for Louisiana's southern parishes, including Allen, Beauregard, Evangeline, Pointe Coupee, St. Landry, Ascension, Assumption, Livingston, part of St. Martin, St. Mary, and Tangipahoa.

The firm will handle sales and service for the full Bucyrus-Erie line of gasoline, diesel, and single-motor electric convertible excavators; dragline buckets; and Hydrocranes and Hydrohoes.

Kelbe Distributes More

Kelbe Bros. Equipment Co., Milwaukee, Wis., has been appointed Wisconsin distributor for Challenge truck mixers, and also for products of C. H. & E. Manufacturing Co., Milwaukee, which makes pumps, hoists, saw rigs, and rollers.

Hobart Welder Branch

Hobart Bros. Co., Troy, Ohio, has announced the opening of a new Hobart Welder Sales & Service branch office and warehouse at 1535 S. Yale St., Tulsa, Okla.

Clyde P. Whitmire is manager of the branch, which carries a full line of Hobart arc welders, electrodes, and accessories.

Nordberg Diesel Distributor

Nordberg Mfg. Co., Milwaukee, Wis., has appointed King-Knight Co., 360 Jefferson St., San Francisco, Calif., as distributor for Nordberg 4FS diesel engines in central and northern California.

L. S. King, president of King-Knight Co., is active in the sales operation of the firm.

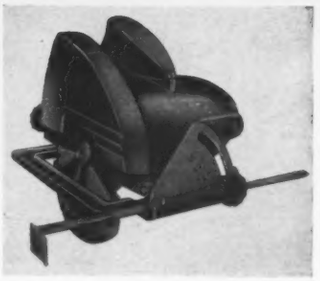
A-C Distributors Named

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced that the company's pumps will be distributed by Louis Montagnon, Inc., 202 Old Sleepy Hollow Road, Pleasantville, N. Y., in Westchester and Putnam counties in New York State, and R. & R. Supply Co., Inc., 531 W. Central Ave., Orlando, Fla., in some areas of Florida. These areas are south of and including the counties of Alachua, Putnam, and St. Johns; north of and including Highlands, Okeechobee, and St. Lucie counties; and east of and including Marion, Lake, and Polk counties.

Equipment Dealers—this is your department, so send your news and photographs—new plants, new lines, and new staff appointments.

New Portable Saw

A 12-pound saw with a 6½-inch blade mitres a 2-inch plank at 45 degrees and has a shoe adjustment for slotting up to 2 3/16 inches deep. The Power-Guide saw is a new



product of the Ram Tool Corp., 411 N. Claremont Ave., Chicago, Ill.

An air-cooled motor in an aluminum housing delivers one hp under peak load. The gearbox is sealed in grease at the factory.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 363.

Vulcan Tools

— FOR —

Rock Drills, Pavement Breakers and Clay Diggers

Vulcan Tool Manufacturing Co.

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Branch Offices and Warehouse Stock.

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Send for catalog or see your local distributor.

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PERFORATED DRAGLINE BUCKET

speeds the wet jobs

• You get big loads fast with this Wellman Perforated Dragline Bucket because excess water goes out while gravel stays in on jobs such as illustrated.

Built of special alloy steel—all welded for strength plus light weight. You can work faster with less maintenance with Wellman dragline buckets.

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—repointing dipper teeth

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plus many unique applications for manganese steel flats, rounds, squares and plate.

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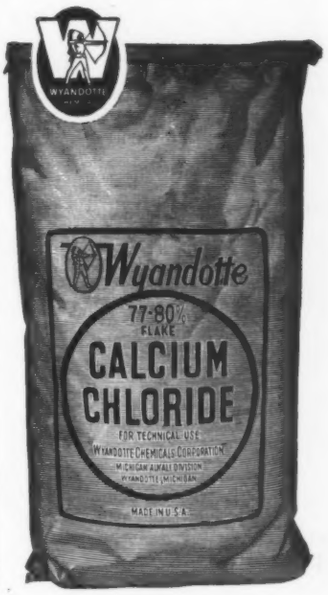

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CALCIUM CHLORIDE

Eliminates dust. Gives good consolidation of surface materials. Stabilizes base for future paving.

Wyandotte Calcium Chloride works for you the year around:

- De-ices
- Keeps fire barrels unfrozen
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- Provides ballast for tractor and equipment tires
- Produces stronger, faster-setting concrete
- Keeps refrigeration brine fluid at low temperatures
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Wyandotte

CHEMICALS

WYANDOTTE CHEMICALS CORPORATION

WYANDOTTE, MICHIGAN

Additions to the tops of the piers show where Mary's 94 truss was raised. New piles on the trestle hold the ends of the new caps. *Houck Photo*

Bridge-Raising Method Permits Normal Traffic

Missouri Pacific Lines Is Completing Long-Range Program of High-Level Tracks Requiring Elevation Increases up to 11 Feet

• RAISING main line tracks and bridges in single-track territory without interrupting train schedules is a feature of construction that has almost become a daily habit with the Missouri Pacific Lines, which has had a high-level track program under way for several years.

Much of the company's vast trackage lies in the Mississippi Valley, where it is subject to the vagaries of seasonal floods which delay passenger service and slow down movement of vital freight.

The high-level track program which began about 1949 has been carried out in cooperation with the Corps of Engineers, U. S. Army, which has made recommendations and suggested new track elevations.

Since then a number of bridges and hundreds of miles of track have been stabilized safely above known flood levels. Many of the new grades were determined by use of the well known Vicksburg, Miss., scale model of the Mississippi Valley with simulated floods somewhat higher than known records. A 10 per cent increase as a safety factor was added to arrive at the desired elevations.

Track Raising

While track and bridge raising is not uncommon, the uncommon heights of some of the new levels plus the fact that the work was carried out all over the system without interfering with normal rail traffic, even in the single-track districts, place the methods in an unusual category.

The grade raises range from a few feet in some cases to as much as 11 feet in others. Types of bridges raised range from simple trusses and trestles to bridges such as the one which spans the Arkansas River north of Fort Smith, Ark., which had its ten 200-foot truss spans and a 366-foot swing span raised 5 feet 6 inches in 1951, without stopping traffic.

Constant repetition in this long-range improvement program has served to perfect the technique to a point where the methods result in important savings in time and money.

Illinois Division

The Illinois Division, which begins at Dupo, Ill., immediately south of East St. Louis, Ill., and extends south toward Memphis, Tenn., along the east bank of the Mississippi, completed a 5-mile track-raising program near Chester, Ill., this year. The section was raised an average of 10 feet, and 355 feet of trestle and bridge over the Mary's River was raised 11 feet.

Grading Contract

Porter-DeWitt Construction Co., Poplar Bluff, Mo., started a 380,000-cubic-yard grading contract on September 1, 1952, and completed the job in May, 1953.

Although the method of building a new embankment with a chat-filled center, without disturbing regular train traffic, has become a standardized procedure, it still can offer problems for contractors and railroad-track crews.

The tracks were raised in 8-inch lifts in convenient sections ranging in length from 500 to several thousand feet. The embankment dirt was

There's A Lansing Barrow For Every Contractor Need!

Lansing Company has been designing and building wheelbarrows for the construction trade since 1881. Experienced design, rugged dependability and quality materials are a part of every model in Lansing's complete line of wheelbarrows.

LANSING F4½ and A4½ WHEELBARROWS

The most popular barrows on the market for handling wet concrete. Capacity 4 cubic feet. 16 gauge steel trays with new hard enamel finish. Choice of wheels.

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LANCO MATERIAL HANDLING EQUIPMENT

Home Office and Factory
LANSING, MICHIGAN

Tops IN DIGGING ABILITY

Omaha Dragline Buckets get out and dig for you. Tough cutting lips of alloy steel are sharp and cut like a garden spade. Faster, easier going . . . completes jobs sooner . . . brings you higher profits. Write now for complete catalog giving specifications of 4 available types.

Of Course IT'S AN OMAHA DRAGLINE BUCKET

DRAKE-WILLIAMS-MOUNT • OMAHA, NEBR.

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Use the Request Cards Between Pages 18 & 19 To Obtain Further Information or Printed Matter on Any Product Advertised or Described Editorially in This Issue

spread alongside the existing track in 8-inch lifts and compacted with a sheepsfoot roller drawn by a D4 Caterpillar tractor. Slopes and crown were shaped with a Caterpillar No. 12 motor grader.

As the dirt fill rose, railroad crews used Duff-Norton and Simplex 15-ton jacks to raise the rails with cross ties attached to a point slightly above the desired lift. Work trains brought in bottom-dump gondolas loaded with chat which were unloaded in the raised sections. The chat was then tamped under the ties and the jacks removed to allow the cross ties to rest on the new foundations.

Thus the crews of the contractor were kept busy spreading the fill while the track gang worked to keep the chat and track up.

When finished, the embankment was 62 feet wide at the base, an average of 10 feet high with a 22-foot level crown and a center strip of chat 10 feet thick. Banks were sloped 2 to 1.

Handling the Dirt

The job proved welcome to Jackson County, Ill., which got a country road cut out of a hillside for free when the contractor used the space for a 130,000-cubic-yard borrow, leaving it graded and ready for surfacing. The remainder of the 380,000 cubic yards came from nearby farms and land owned by the railroad company.

There was no rock excavation requiring blasting and shovel loading and all the dirt was handled by a fleet of scrapers assigned as follows:

For short hauls up to 500 feet, an 18-cubic-yard No. 80 Caterpillar scraper and two 13-cubic-yard LeTourneau LP Carryalls were used with three D8 Caterpillars for tow tractors.

For the long hauls which ranged up to 8,000 feet, five 15-cubic-yard Euclid scrapers operated from borrow pits on a single-lane road with turn-outs for passing. The existing track followed the river bank. Four D8's push-loaded and bladed spill between loads. A D6 dozer was assigned to the fill area where it "busted" the humps, smoothed the spread, and worked the banks.

The contractor averaged 3,000 cubic yards per day on the long hauls.

Raising the Bridge

The Missouri Pacific tracks bridge the Mary's River just south of Chester, Ill., over 205 feet of open-deck wooden trestle and a 150-foot through-truss steel span on two concrete piers. The through Pratt truss is pin-connected and designed for Cooper's E-60 live loading and with a dead load factor of approximately 2,000 pounds per linear foot.

The plans called for raising the bridge, including the trestle work, 11 feet, and construction of 24 feet of new trestle on each end.

Constant use of the bridge-raising technique has developed efficient routines which may be varied at will to suit the immediate needs of the moment. In this instance the procedure was like this:

Duff-Norton 100-ton air jacks were placed under the end floor beams of the bridge just inside the grillages; alternate ends of the bridge were raised in sequence in 8-inch lifts and grillages were placed. Jacks were placed at each end of the bridge for the lifting operation and after the grillage had been secured, grillages were moved beneath the jacks to bring them up to the proper level to complete another lift. As each layer of grillages was placed in position the pieces were welded and secured to the underlying layer. When the first 3-foot lift had been completed, wooden forms were built around the grillages and concrete was poured into the cavity to form a casing. This was repeated in two successive 3-foot lifts and a final 2-foot lift. Then the concrete grillages were capped

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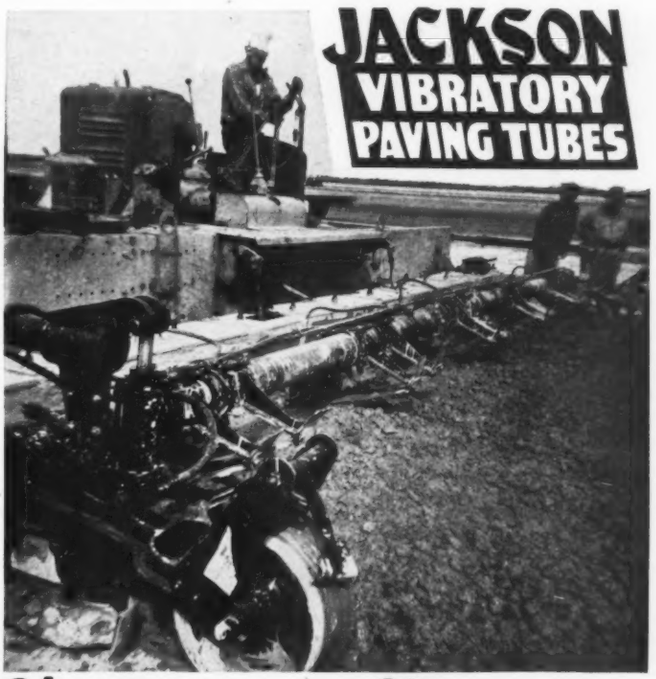
Bents are in place (left), while at the right false work still supports the trestle. Two additional 55-foot piles remain to be driven for the two right bents. *Houck Photo*



Now SUPER-POWERED More FLEXIBLE
FOR THOROUGH INTERNAL VIBRATION
OF ALL SLABS 6" TO 24" THICK - UP TO 25' WIDE!

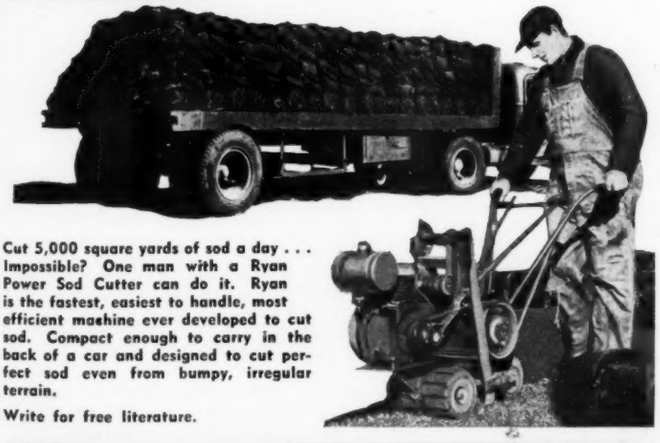
Now supplied with far more powerful motors, as many as five to the 25' width, there is no job of concrete HIGHWAY OR AIRPORT PAVING too tough for the JACKSON VIBRATORY PAVING TUBE! Extremely flexible, it may be had with just the number of motors needed and vibratory frequency variable to suit concrete mix. Easily attached to standard finisher or spreader, its use assures:

1. Maximum compressive strength and impermeability of the hardened concrete through use of dryer, more economical mixes. 2. Faster finisher progress in normal highway paving. 3. Complete and uniform compaction throughout the mass, with no mortar streaks — even on 25' airport slabs. (It is equally efficient where air-entraining cement is used). 4. Adequate puddling at sideforms on the average paving job. 5. Excellent finish without excessive mortar. 6. Reduction in spreading cost wherever a spreader is not used . . . the powerful vibratory action and plasticity achieved, smooths out the major humps and hollows.

For better results, as well as time-and-money savings to be achieved on any major concrete paving job, get the complete facts concerning the Jackson Vibratory Paving Tube. See your Jackson Distributor or write to us.

JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

5,000 square yards of SOD a day . . . with a *Ryan*



Cut 5,000 square yards of sod a day . . . Impossible? One man with a Ryan Power Sod Cutter can do it. Ryan is the fastest, easiest to handle, most efficient machine ever developed to cut sod. Compact enough to carry in the back of a car and designed to cut perfect sod even from bumpy, irregular terrain.

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ST. PAUL 1, MINNESOTA

In the borrow area a Caterpillar D8 tractor push-loads a Euclid scraper. *Houck Photo*

Bridge-Raising Method Permits Normal Traffic

(Continued from preceding page)

with a shoe secured to the bridge floor.

Since normal train traffic was maintained in this single-track territory, the actual raising of the bridge took considerable time, since the trestles had to be brought up to their new level following each lift and all had to be synchronized with the raises of the track which came to the bridge on the new embankment.

Trestle Raising

Mechanical jacks were used for raising the trestle which was temporarily supported on false work made of 8 x 16-inch timbers based on the old 14 x 14-inch caps. Additional support for the new caps at the new higher level was provided at each bent by a new 55-foot creosoted 19-inch butt piling driven to refusal at each side on a 2½ to 1 batter. Driving was done with a 30-C Vulcan steam hammer in the leads of a locomotive crane. The new caps extended over the new piles; the pony bents were placed and the false work was removed. The new top section was tied to the original portions of the trestles by diagonal and longitudinal bracing.

Concrete Backwalls

The transition from earthen embankment with chat center to wooden trestle was accomplished with concrete backwalls precast in the railroad company's plant at North Little Rock, Ark. These beams form a retaining wall at the same time.

Personnel

The work was under supervision of W. H. Hobbs, chief engineer for Missouri Pacific Lines, who used an 18-man bridge gang on the bridge and trestle work. Actual track raises, including application of ballast, was done by Missouri Pacific extra gangs.

Porter-DeWitt Construction Co., which did the grading on the bridge work, had 20 men on the job and was represented by E. E. Shelden, superintendent.

Owens . . . are FAMOUS for "FIRSTS"

. . . First choice of the clamshells amongst progressive contractors and operators who "dig for" profits, large or small, all over the world.

An OWEN BUCKET takes the "first" bite into the earth. Starting the new $5,000,000 E. 55th Street Interchange with Shore Drive. Cleveland, Ohio

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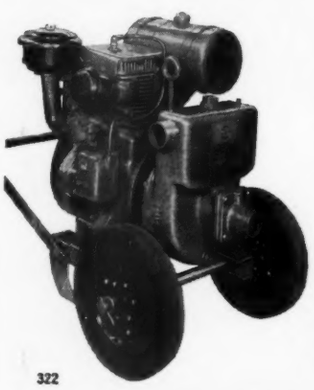
FEATURES	MARLOW	PUMP "A"	PUMP "B"	PUMP "C"	PUMP "D"	PUMP "E"
1. Non-Recirculatory Positive Priming	YES	YES	NO	YES	NO	NO
2. Self-Cleaning	YES	YES	NO	YES	NO	NO
3. Low Suction Inlet	YES	NO	NO	NO	YES	NO
4. Horizontal Discharge	YES	NO	YES	YES	YES	YES
5. Metal - to - Metal Grease - Lube Seal	YES	YES	YES	YES	YES	YES
6. Vacuum Gauge Plug	YES	NO	NO	NO	YES	YES
7. Discharge Gauge Plug	YES	NO	NO	NO	YES	NO
8. Supplied Complete with Male Fittings	YES	NO	NO	NO	NO	NO
9. Impeller Keyed to Shaft	YES	NO	NO	NO	NO	NO
10. Only One Gasket	YES	YES	NO	YES	NO	NO
11. Replaceable Wearing Parts	YES	YES	YES	YES	YES	NO
12. Convertible Base and Chassis	YES	NO	YES	YES	NO	NO



322

Yes! Marlow, and Marlow *alone,* gives you *all* the features in dependable engine-driven, self-priming centrifugal pumps that bring you high efficiencies and low operating and maintenance costs. That's why contractors are buying *more Marlows than any other pumps!*

For complete information on how Marlow can help give you more pump performance – at less cost – see your Marlow dealer or write for Bulletin C-52.

MARLOW PUMPS

Other factories in France and England

RIDGEWOOD, NEW JERSEY

Branch Plants: DeQueen, Arkansas; West Chicago, Illinois

Distributors and Dealers everywhere

Road Disk Attachment

A new 2-section gang-type road disk attachment that operates on the scarifier controls of motor graders is announced by T & M Mfg. Co., 1920 Niles St., Bakersfield, Calif.

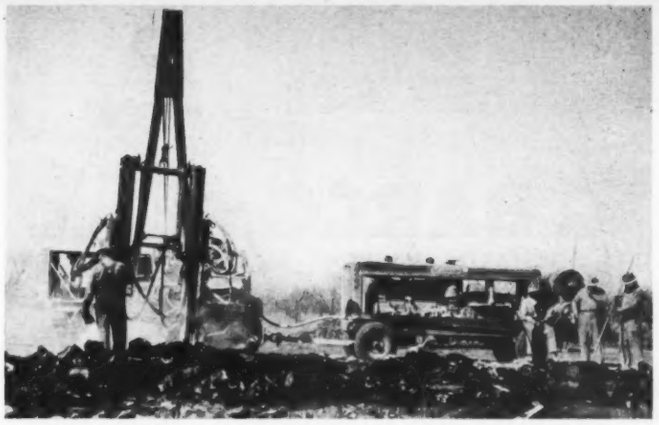
The Shav-O-Disc cuts furrows at a width of 64 inches. Disks have individual hard-faced cleaners. All parts are replaceable from standard stock.

When mounted on a motor grader, the attachment leaves the grader blade in free operation.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 384.

Steel Column Fire Tests

Columns are generally required by building regulations to be fire-resistant. Ratings of building components, based upon the results of standard fire tests of the same severity, are reported in "Fire Tests of Steel Columns Encased with Gypsum Lath and Plaster", National Bureau of Standards Building Materials and Structures Report 135, by Nolan D. Mitchell and James V. Ryan. The report, which explains how the tests were made and gives the results, can be obtained from the Government Printing Office, Washington 25, D. C., at a charge of 15 cents.



The TBD-126 twin-boom pipeline drill represents the latest Schramm rock-drilling outfit for pipeline trenching. The twin drill air-feed assemblies and drifters are suspended from crawler-tractor booms. With a Schramm 600-cfm diesel-engine compressor towed for the power unit, it becomes a self-contained mobile unit. For further information write to Schramm, Inc., West Chester, Pa., or use the Request Card at page 18. Circle No. 355.

New Way to Reduce Sling Costs 22.3%

Notice how Pin-Lock Thimbles are held securely in position by steel pins. These pins make it easy to transfer Pin-Lock Thimbles to replacement Red-Strand Slings.

Save by reusing Pin-Lock Thimbles on Red-Strand Braided Slings

Now . . . *stop* discarding still-good sling thimbles! With Red-Strand Braided Slings, you simply transfer *reusable* Pin-Lock Thimbles from one sling to another. *Cut costs substantially.*

Savings of 22.3% are typical. See chart at left for other examples.

Pin-Lock Thimbles also guard against unexpected damage to sling loops. They're made of extra heavy, extra durable cast steel.

You save still more because Red-Strand Slings are made of higher-than-rated quality Leschen wire rope—famous for longer-than-expected service.

Doesn't this suggest checking Red-Strand Slings *right now?*

HERE'S HOW MUCH YOU SAVE WITH Red-Strand SLINGS AND Pin-Lock THIMBLES	
Sling Size	% Savings
5/16" x 10'	33.0%
1/2" x 10'	23.6%
1/2" x 20'	17.2%
3/4" x 8'	22.3%
1/4" x 5'	15.5%
3/16" x 8'	13.0%
3/32" x 10'	8.5%

See your LESCHEN representative or write for folder, "NEW IDEAS in Slings."

A. Leschen & Sons Rope Co.
St. Louis 12, Mo.

LESCHEN

Red-Strand SLINGS & WIRE ROPE
of Higher-Than-Rated Quality

There's a power-full difference
—in more ways than one

The old-fashioned scene seems picturesque now — a lamplighter with his flickering taper, the street lamp casting its uncertain light. Today, not only are America's cities lighted brilliantly by modern electric power, but the country's industry is geared to it, world communications depend upon it.

The construction of modern power plants is one of the achievements of building contractors from one end of the nation to the other. The Ætna Casualty and Surety Company has bonded many such projects, giving contractors everywhere prompt and efficient service — the kind of service that often speeds up operations all along the line. That is why so many contractors bond with *Ætna* — always.

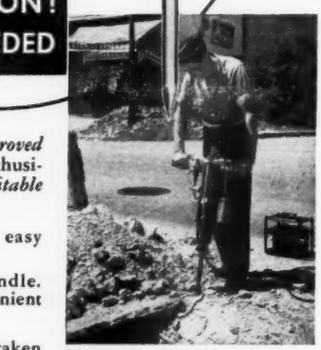
No job too big—no job too small

ÆTNA CASUALTY AND SURETY COMPANY
AFFILIATED COMPANIES: ÆTNA LIFE INSURANCE COMPANY
AUTOMOBILE INSURANCE COMPANY • STANDARD FIRE INSURANCE COMPANY
HARTFORD 15 CONNECTICUT

A profitable tool with many uses!

BARCO *Gasoline* HAMMER

ONE MAN OPERATION!
NO COMPRESSOR NEEDED



HERE'S why owners of the *improved* Barco Gasoline Hammer are enthusiastically acclaiming it as *"A Profitable Tool With Many Uses!"*

- New ignition system—quick, easy starting; trouble-free.
- Quick cable disconnect at handle. New handle design; switch convenient to operator's thumb.
- More portable than ever! Easily taken to any location by car, truck, or light plane.
- Versatile! A handy tool for Pavement Breaking . . . Cutting . . . Digging . . . Rock Drilling . . . Frost Breaking . . . Rod Driving. Ideal for general utility, standby, and emergency service.
- Economical! Low first cost, low operating expense, low maintenance expense. Quickly pays for itself.
- Powerful, rugged. Up to 1550 strokes per minute.

ASK FOR A DEMONSTRATION — See for yourself—ask for our nearest distributor to give you a demonstration.

Send for a copy of this interesting new Bulletin No. 613 — "BARCO GASOLINE HAMMERS".

BARCO *Manufacturing Co.*

518H Hough St., Barrington, Illinois
A Chicago Suburb

PAVEMENT BREAKING — Used by municipalities and utilities to make street openings, break curbs, and cut trenches.

ASPHALT CUTTING — An easy, fast job with a Barco Hammer.

EMERGENCY WORK — Day or night, one man can take tool to any location.

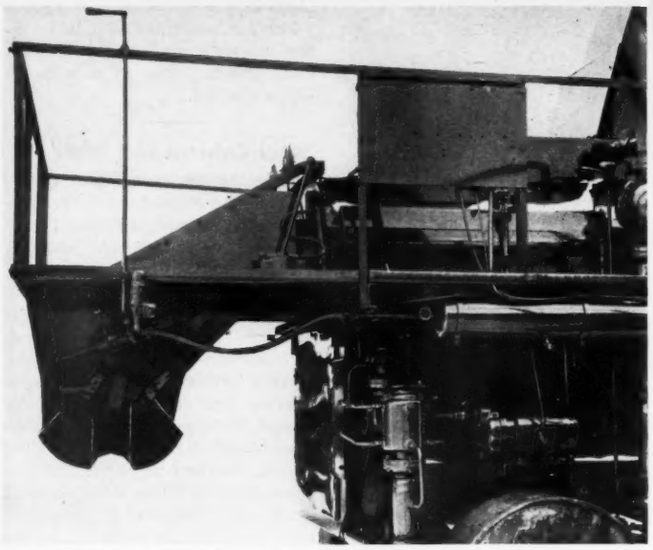
GASOLINE HAMMERS AND RAMMERS

Yours---For the Asking

1. Literature or further information from any C & E advertiser in this issue
2. Further information on any new product described editorially in this issue
3. A reprint (while they last) of our article "Pressure-Injected Spread Footings Support 12-Story Building." Also "How Portland Cement Is Manufactured Today."

Use the request card bound in at page 18. No postage is required.

Contractors and Engineers
the BIG magazine of construction
470 Fourth Ave., New York 16, N. Y.



The twin clam gates improve Pioneer Continuflo asphalt plants.

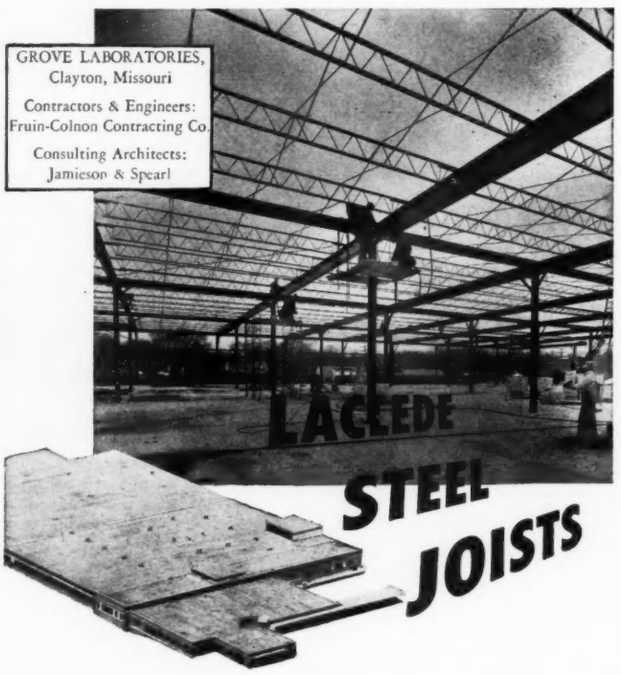
Improve Asphalt Plants

Models 51 and 101 Pioneer Continuflo asphalt plants have a new-type truck-loading hopper with twin clam gates on the mixer units. The gates are steam-cylinder actuated by a lever extending up to the operator's platform.

Capacities of the discharge hoppers have been increased. The hopper on the small mixer now holds over a ton of material, and the hopper on the larger mixer holds approximately two tons. Together with the addition of the new twin clam gates, the increased hopper capacities are intended to permit operators to unload a uniform, non-segregated mix at a steady pace.

For further information write to Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 476.

A list of coming conventions appears on page 101 of this issue.



for FRAMING LARGE AREAS ECONOMICALLY... QUICKLY

Specify These Laclede Products: Welded Wire Fabric • Form & Tie Wire • Multi-Rib Reinforcing Bars • Joists • Corrugated Steel Centering • Spirals • Conduit • Steel Pipe • Electrical Weld & Gas Weld Tubing

LACLEDE Producers of Construction Steel
LACLEDE STEEL COMPANY
St. Louis, Mo.

Front-end loader on a Sheppard diesel tractor.

Loader and Backhoe On Diesel Tractor

A front-end loader and a rear-mounted backhoe on the Sheppard wheel-type diesel tractor are offered as a unit. Both backhoe and loader are hydraulically operated.

The backhoe works down to 10 feet deep and has a capacity of 15 to 30 yards per hour in average soil conditions. The loader lifts up to 5,000 pounds at a scoop.

The unit does leveling, grading, loading, and digging. The manufacturer stresses the saving in fuel costs because diesel power is used.

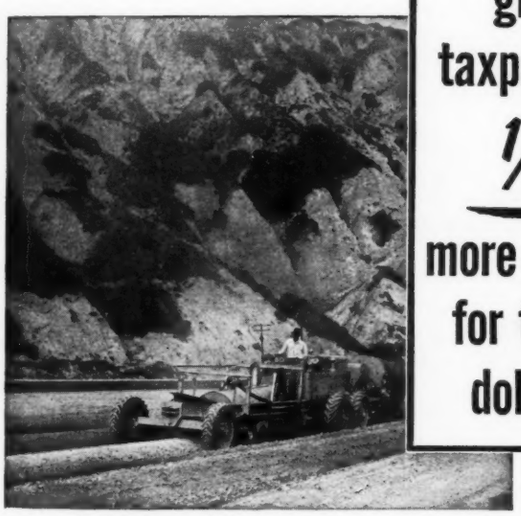
The company also offers its diesel tractor with either the front-end loader or backhoe alone.

For further information write to R. H. Sheppard Co., Hanover, Pa., or use the Request Card at page 18. Circle No. 450.

Motorola Moves Office

The southwest regional office of Motorola Communications & Electronics, Inc., Chicago, Ill., has been moved from 6310 Denton Drive, Dallas, Texas, to new quarters at 171 Parkhouse St., in the Trinity industrial district of the same city.

The regional office, with Regional Manager E. L. Falls, Jr., in charge, serves Texas, Oklahoma, New Mexico, Arkansas, and Louisiana, and supplies 60 per cent of all 2-way radio communications in this area.



give taxpayers 1/3 more roads for their dollar—

with a WOOD Roadmixer

Give your taxpayers the finest roads that money can buy with a Wood Roadmixer—at savings up to **one-third** over methods you are now using. Give the taxpayer **just that many more miles of road for his dollar.** And we have the facts to prove it!

The Model 42 Wood Roadmixer, shown above, is a complete traveling mixing plant. It mixes in **one pass** all types of soils or aggregates—native or imported—with any kind of liquid binder used in mix-in-place pavement construction. It is **one-man operated** and produces up to 200 tons of ready-to-spread mix per hour. It is self-propelled. It requires no heavy transport equipment to move from job to job.

Also available the Model 54 for the big jobs—the Model 36 for the small jobs.

For **job record facts** on Wood Roadmixers and other Wood Roadbuilding equipment, see your Wood distributor or write us direct.

Box 620 • 6900 Tujunga Ave.
North Hollywood, California

WOOD MANUFACTURING CO. (ROADBUILDING EQUIPMENT)

Export Offices: 3938 Wilshire Blvd. • Los Angeles 5, Calif. • Cable Address: Woodco

MODEL R HI-WAY SPREADER

Here is the Spreader that *outperforms all others*, as proved by actual field tests and on-the-job figures!

Use it for any type of aggregate from fine sand to crushed stone. It will spread forward or reverse, with control of material flow. By using baffles, you can control the width of the spread from one foot to the maximum. You'll be amazed at *Model R's* record of operational economy. Available in sizes from 8' through 13'.

MODEL DD TAILGATE SPREADER

Here is the economical *all-purpose, all-weather* Spreader—used in the summer for dust control and for seal coating, and in the winter for spreading sand, cinders or rock salt on icy pavements.

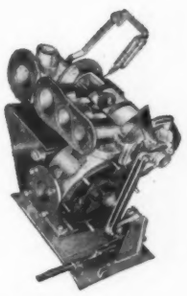
Model DD fits any standard dump truck body and can be attached or detached in one minute. It gives a uniform spread 4 to 60 feet wide, at 1 to 35 miles per hour. *Model DD* will give you years of economical, trouble-free service.

Sold by leading distributors throughout the U.S., Canada and many foreign countries

HIGHWAY EQUIPMENT COMPANY, INC. CEDAR RAPIDS, IOWA, U. S. A.
MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS

ROSCO'S P. M.*
. . . Accurate application with the Rosco BITUMINOUS DISTRIBUTOR

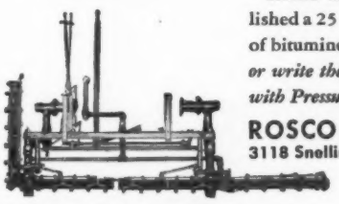
Pressure Metering PATENTED permits the operator to use any length of spraybar—from 1 to 24 feet—*without changing the pressure* and *without any application adjustment whatever.* This "built-in" control of pressure is the only accurate method of obtaining precise bituminous application.



Cutaway View of the Rosco 7-Way Master Valve

Application of bitumen is *not* metered by the bituminous pump, nor is the amount of discharge measured in relation to the revolutions of the pump. Normal wear of the pump and occasional, unavoidable nozzle clogging never affect the application rate. The rate is automatically maintained by Rosco's patented P.M. system, an integral part of the Master Valve. It's this valve that also directs the flow of material for all of the Rosco Distributor functions.

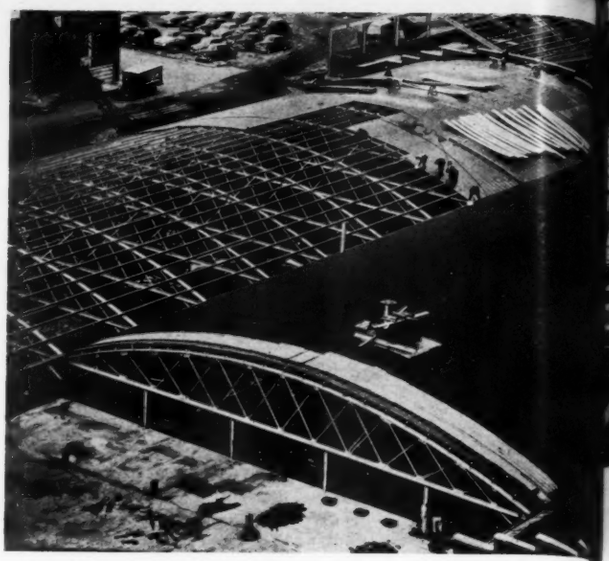
Rosco Distributors with P.M. have established a 25 year record for accurate application of bituminous materials. *Ask your Rosco dealer, or write the factory for bulletins on Distributors with Pressure Metering.*



The Full-Circulating Rosco Spraybar

ROSCO MANUFACTURING CO.
3118 Snelling Avenue • Minneapolis 6, Minn.

Preformed Steel-Roof Decks Used on Industrial Buildings



• THE last of seven building units, being constructed to house the facilities of several different manufacturers, is currently being completed in Pelham Manor, N. Y. Six of the units, on which construction began about 18 months ago, cover an area of 142,000 square feet. These units are of bow-string truss construction, while the seventh unit is of rigid frame roof construction.

Tri-Rib Steel-Deck Roofing

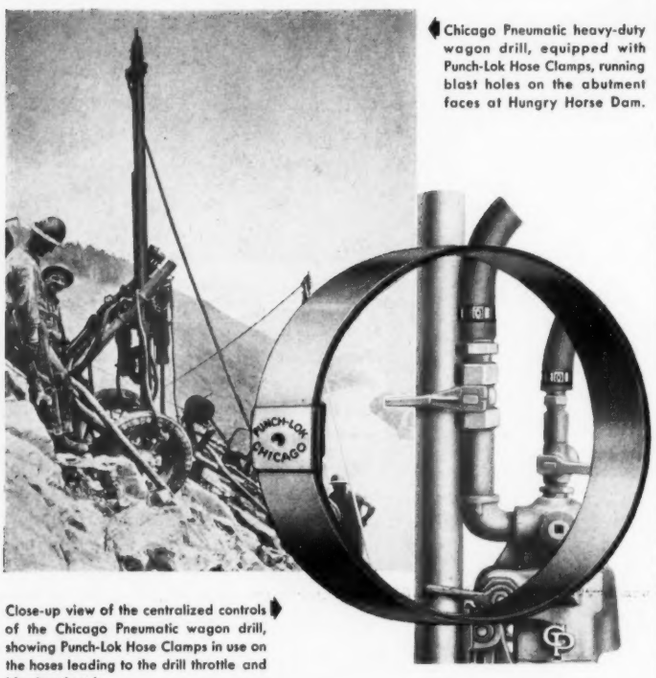
The contractor for the project, Rusciano & Son Corp., Bronx, N. Y., is using steel-roof deck, preformed and precut to exact roof size and contour. The new steel-frame masonry-wall buildings are being roofed with 242,000 square feet of Tri-Rib steel deck, supplied by Wheeling Corrugating Co., Wheeling, W. Va. The Tri-Rib roof-deck panels for the bow-string roofs arrive at the construction site precurved to a radius of 138 feet 11 inches, and vary in length from 20 to 22½ feet. Each panel is 18 inches wide, covers about 30 square feet, yet weighs only about 67 pounds.

Application

Easily handled by one man, when necessary, the Tri-Rib panels "go

The Perfect ANSWER FOR
ON-THE-JOB HOSE MAINTENANCE

PUNCH-LOK
HOSE CLAMPS



Chicago Pneumatic heavy-duty wagon drill, equipped with Punch-Lok Hose Clamps, running blast holes on the abutment faces at Hungry Horse Dam.

Close-up view of the centralized controls of the Chicago Pneumatic wagon drill, showing Punch-Lok Hose Clamps in use on the hoses leading to the drill throttle and blowing throttle.

With Punch-Lok Hose Clamps on the job . . . you're sure of having truly dependable hose connections. Maintenance costs are reduced because of Punch-Lok's trouble-free performance. When hose repairs are needed . . . Punch-Lok again saves you time and money. You'll be amazed to see how quickly and easily Punch-Lok Hose Clamps are applied.

See Your Near-by PUNCH-LOK Distributor

"The Sign of a Good Hose Clamp"

PUNCH-LOK Company

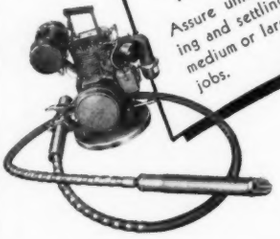
321 North Justine Street, Chicago 7, Illinois

4168

Plan to Reduce Costs on Your Job

ELECTRIC HAMMERS and Self-Rotating HAMMER DRILLS
Powerful, electromagnetic—deliver 3600 blows per minute for drilling, cutting, channeling, scaling, etc.

CONCRETE VIBRATORS MASS - FORM
Assure uniform compacting and settling on small, medium or large concrete jobs.

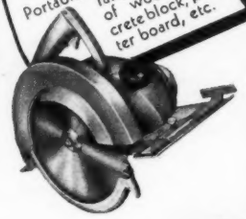


You can plan to cut time and costs on your next construction job by using Syntron Power Tools to meet the toughest work schedules without interruption.

Syntron's complete line of Portable Power Tools are built for heavy-duty commercial use. They stand up under continuous operation on job after job.

GASOLINE HAMMER ROCK DRILLS AND PAVING BREAKERS
Completely self-contained — automatic rotation of drill bit. For drilling—digging—cutting—tamping.

DUAL V-BELT DRIVE ELECTRIC SAW
Portable—heavy duty—for fast, easy cutting of wood, concrete block, plaster board, etc.



PORTABLE POWER TOOLS by

DIESEL PILE HAMMERS
Entirely self-contained. Extra heavy-duty units that require no auxiliary equipment. Variable, remote controlled operation.

SYNTRON

Write for Complete Tool Catalogue — FREE —

SYNTRON COMPANY
227 LEXINGTON AVE.
HOMER CITY, PA.

At left, Tri-Rib steel-deck installation under way on one building unit, and beside it, a complete installation partially covered with an all-weather, insulated, built-up roof. Above, a workman makes the final weld on a Tri-Rib panel while others bring up the next panel to be installed.

down" quickly. A 4-man crew, consisting of 2 welders and 2 erectors, can lay 4,000 square feet of the steel deck in a good day. At Pelham, a crane lifts bundles of Tri-Rib panels to the crew who subsequently place and weld the panels. A finish coat of aluminum paint is applied to the underside of each panel before it is welded in place, serving as the interior ceiling color. Each steel-deck panel fits snugly and is welded to every structural member it crosses.

A built-up roof covers the steel deck. Designed for long trouble-free protection, it consists of 1-inch-thick insulating board covered with three layers of asbestos roofing with asphalt between them.

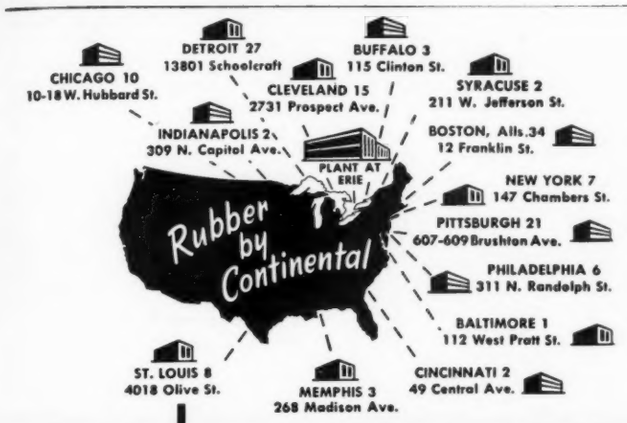
Advantages

Because of its extremely light weight, little more than 2 pounds per square foot on the Rusciano project, Tri-Rib steel deck cuts requirements for structural-steel members such as columns, trusses, and purlins by as much as 20 per cent. This saving is realized without any sacrifice in strength and permanence, as the steel deck is protected indefinitely by its all-weather covering.

PC Association Elections

Carl D. Frank, for the past 14 months executive vice president of the Portland Cement Association, has been elected president of the organization. Mr. Frank has served with the Association since it established its main offices in Chicago, Ill., in 1916.

G. Donald Kennedy, formerly consulting engineer and assistant to the president, has been elected executive vice president.



. . . WHEREVER your job is

Suction Hose

Rubberized Clothing

Rubber Boots

CONTINENTAL

has a nearby warehouse to give you "RIGHT NOW" SERVICE

Serving your rubber requirements is an exclusive business—not just a sideline—at Continental's Warehouses.

These Continental warehouses carry extensive stocks of contractors' hose, boots and rubberized work clothing. They're located within convenient telephone and delivery range of most industrial centers. And they're staffed with people specially trained to cater to your rubber goods needs. You enlist the services of specialists in rubber when you call a Continental Warehouse.

SO—when you need hose, boots, or clothing—be sure to get acquainted with the Continental Warehouse nearest your job. You'll like the service you get.

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FREE Catalog

CONTINENTAL RUBBER WORKS
1989 Liberty Street, Erie 6, Pa.
Please send copy of Contractors' Rubber Products Catalog.

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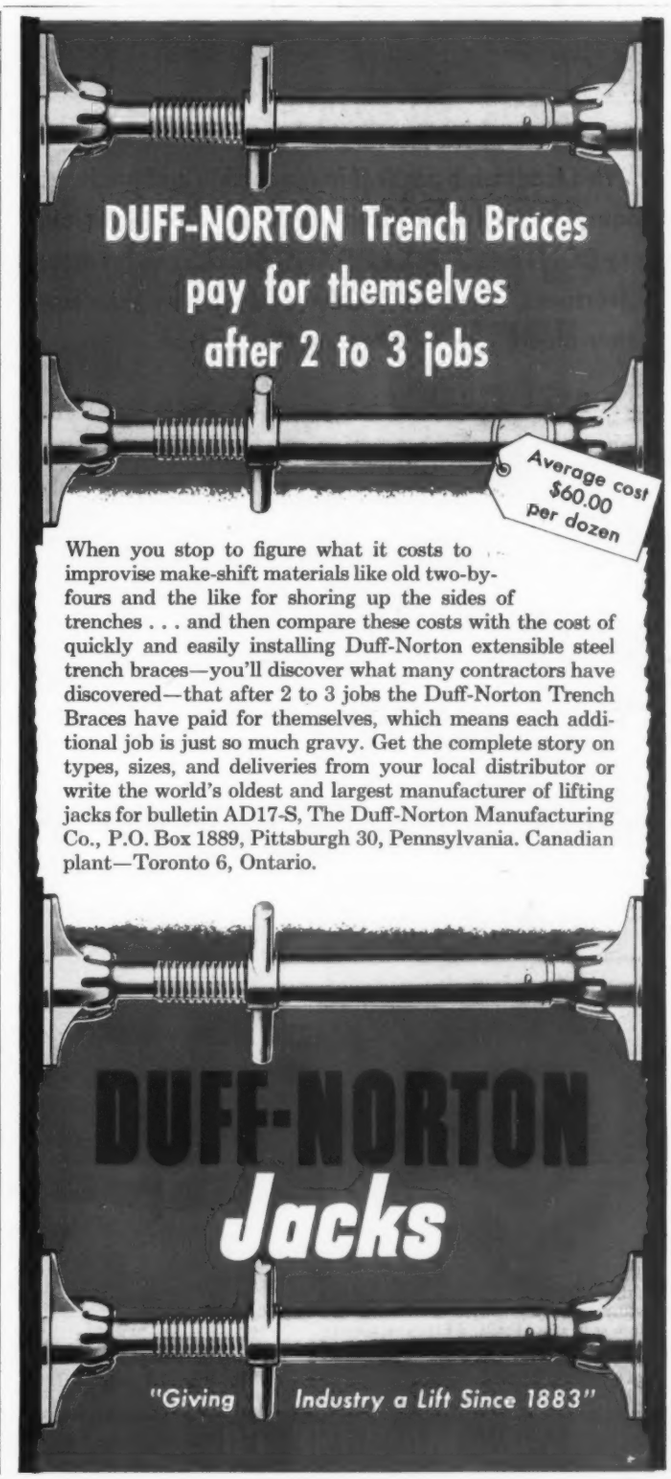
CITY and STATE_____


DUFF-NORTON Trench Braces
pay for themselves
after 2 to 3 jobs
Average cost
$60.00
per dozen
When you stop to figure what it costs to improvise make-shift materials like old two-by-fours and the like for shoring up the sides of trenches . . . and then compare these costs with the cost of quickly and easily installing Duff-Norton extensible steel trench braces—you'll discover what many contractors have discovered—that after 2 to 3 jobs the Duff-Norton Trench Braces have paid for themselves, which means each additional job is just so much gravy. Get the complete story on types, sizes, and deliveries from your local distributor or write the world's oldest and largest manufacturer of lifting jacks for bulletin AD17-S, The Duff-Norton Manufacturing Co., P.O. Box 1889, Pittsburgh 30, Pennsylvania. Canadian plant—Toronto 6, Ontario.
DUFF-NORTON
Jacks
"Giving Industry a Lift Since 1883"

McCloskey Appoints Kelly

James B. Kelly, who is entering his 45th year in the engineering and construction field, has been appointed vice president of McCloskey Co., Pittsburgh, Pa., engineer and builder of industrial plants and buildings. In his new position Mr. Kelly will act as special consultant. He has most recently been president of Mellow-Stuart Co., Pittsburgh.

Four Major Facts about C&E

1. It carries more editorial material than any other monthly publication in the field.
2. It also carries a higher proportion of editorial to advertising content.
3. C&E carries more display advertisers than any other monthly, and,
4. More exclusive advertisers.

This leadership pays off in readership and produces inquiries and orders for advertisers. It helps explain why CONTRACTORS AND ENGINEERS carries more advertisers, and more exclusive advertisers than any other monthly in the construction market.

A 2-line inquiry will bring you the facts you want about the huge construction market.

Contractors and Engineers

the BIG magazine of construction

470 Fourth Ave., New York 16, N. Y.

Road Base in Texas Stabilized With Lime

Heavy Clay Hydraulic Fill Made Into Acceptable Base When Slaked Lime Is Added to Improve Bearing Value

• FAR down along the Texas Gulf Coast, where highway engineers build roads under adverse conditions, the Texas Highway Department has taken a hydraulic clay fill with a plasticity index of 45-50 and lowered that plasticity index an average of 15 points by the addition of 4 per cent slaked lime. Lime stabilization is giving spectacular engineering results.

Immediately after mixing in the lime, the tricky clay—which up to that point often fails to carry automobiles—jumps in bearing value enough to take loaded trucks without deflection.

Lime stabilization was introduced in Texas several years ago when experiments were conducted around Austin with high-plasticity index material. The job represents the first time it has been used in the Beaumont district, where the work is located. Present indications point to promising results.

The work is being done under a $762,592 contract with Trotti & Thompson, Inc., on Texas State Route 87, Spur 214, SH-73, and Farm to Market Road 823. The job is located slightly west of Port Arthur, Texas, and when completed, in all likelihood, will carry a considerable amount of 18,000-pound wheel-load traffic. The job is 5.4 miles long.

When the work was originally planned, the only available embankment material within economical range was a heavy viscuous blue clay which could be recovered best by hydraulic dredging methods. In 1949 a contract was let to McWilliams Dredging Co. for the construction of this hydraulic embankment, wide enough to accommodate an eventual 4-lane divided highway. The dredges "Natchez" and "Shirley" were brought in, and by October 12, 1950, the hydraulic embankment was in place.

In the 2-year period during which the fill was allowed to settle, the hydraulic fill lost little, if any, of its moisture content. A tough dry scab about 4 inches thick formed over the outside of the embankment, but close underneath was a sticky brand of road-building trickery which discouraged every highway engineer who looked it over to decide what could be done with the material.

One Lane Being Built

The job which Trotti & Thompson is now building consists of the north lane of what eventually will be a modern divided 4-lane highway. Plans call for the placement of 4 per cent by weight of lime (totaling about 27 pounds per square yard) in the upper 8 inches of the clay fill. This lime stabilization is 41 feet wide, and extends 2 feet past the shoulder line on both sides of the roadway. Shoulders are 8 feet wide on the outside and 5 feet wide on the inside of the north lane.

On top of the 8-inch compacted lime stabilization, the design calls for 8 inches of select sandy material, placed wide enough to insure positive drainage from edge to edge of the embankment. On top of that, a 10-inch sand-shell cushion 28 feet wide is specified, along with a prime coat of MC-1. After this material is down, a roadway consisting of 1 inch of asphaltic concrete 24 feet wide is to be placed. For the time being, the job will not be sealed. This general design holds true for the major portion of the work, with the only difference being in a spur

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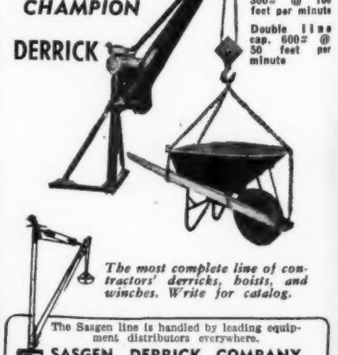
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Bulk lime for the stabilizing operation is being spread by special spreader box and D7.

When material was wet, aeration was done quickly with the aid of Seaman tillers.

Ray Day Photo

section which feeds traffic to Route 73. It is being paved 48 feet wide, without a dividing median, under the present contract. Base thicknesses and treatment are typical in this transition of the other sections.

Principal items in the stabilization portion of the contract consist of 227,726 square yards of stabilized subgrade at a contract price of 27 cents per square yard; a total of 3,073 tons of lime at $26.70 per ton; and 136,309 cubic yards of select borrow material, with 27,000 cubic yards of fine admix.

Trotti & Thompson moved in by mid-October of 1952 to begin work, and is now sufficiently ahead of schedule so that the road will be finished by early fall of 1953.

Lime Stabilization

Throughout its length, the hydraulic clay fill had been placed and finished within plus or minus 1 inch of theoretical grade. Specifications called for Trotti & Thompson's crews to reshape this subgrade, and make it absolutely true so far as grade was concerned. Two Caterpillar No. 80 scrapers with D7 pulling power were moved in for this operation. A 99-M Austin-Western motor grader also was assigned for some of the final blade work.

Work had been under way only a few hours before it was apparent to everyone that extreme care would have to be taken to keep the machinery from bogging down. Sections from 1,200 to 2,000 feet long were worked at one time, and special care was taken to open up these work areas in such a way that if rain came, the material could be quickly shaped and sealed by pneumatic rollers to shed as much water as possible.

After this operation was finished, stabilization progressed by the following general steps:

1. Lime Spreading: The 4 per cent lime content in each section came from the plant of Austin White Lime Co., in Austin, Texas, and the material was shipped in to the job in hopper-bottom cars. A Johnson cement unloader was used at the track for the unloading of this material. A small shed was built around the discharge chute of the machine, so that it would be protected from wind,

(Continued on next page)

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BETHLEHEM STEEL

Road Base in Texas

(Continued from preceding page)

which turned out to be quite a problem.

Three 5-yard Ford F-8's hauled the material from the railroad siding to the job, where it was spread directly on the ground without further plowing or disturbance of the subgrade. Proper spreading of the lime content caused considerable concern in the contractor's organization until B. M. Thompson designed a spreader box capable of holding about 4 tons of material and metering it accurately as it moved along. The box consisted simply of a sheet-metal hopper, covered by a tin roof to prevent wind from blowing the material too badly. The spreader was powered by a Wisconsin gasoline engine, and had a screw-type feed, mounted on its center axle. The feed bar was driven by a chain belt from the gasoline engine.

An Austin-Western 99-M motor grader blades lime-stabilized material from a windrow so Tampo sheepsfoot rollers can compact the initial lift of material. *Ray Day Photo*

The hopper was 10 feet wide, but could be extended to spread 11 feet and could also be choked to reduce the width of spread down to 7 feet. In this way, increments could be planned to cover all subgrade widths called for in the plans.

On the biggest day's run, this spreader box handled about 70 tons of lime in a 9-hour run. Lime was spread only in reasonably calm weather, because high winds obviously permitted too much of the material to blow away.

2. Mixing: Immediately following the spreading of the lime, the white material and subgrade clay was plowed to a depth of about 4 inches. For this operation, an International 3-bottom plow pulled by a Minneapolis-Moline tractor was used. This initial operation, done to a 4-inch depth, had amazing results. Subgrade which had been treacherous before began almost immediately to demonstrate increased bearing value. Following closely behind the plowing operation came three Seaman power tillers, each machine being equipped with wide pulverizing tines with a 3-inch crook.

The number of passes made by the Seaman tillers depended entirely on the weather and the general wetness of the material, but in all cases the lime was mixed down to a loose depth of about 14 inches, so that the compacted treatment would total 8 inches. After some experimentation, a satisfactory method of working the material was found. The best way seemed to indicate two to three passes, mixing the lime down 14 inches. The ground was then shaped up for drainage, and sealed off by light compaction with rubber-tire rollers. No further work was done then, for a period of at least three days, and in some cases the material was allowed to stand as long as 4 weeks.

This period of standing permitted a chemical action to take place between the clay and the lime, and the action seemed to permeate the soil particles all around, changing its sticky soap-like structure to a fine granular appearance. It was vitally important, contract officials found, to mix the lime to the full depth during the initial operation, because if that was not done, trouble was

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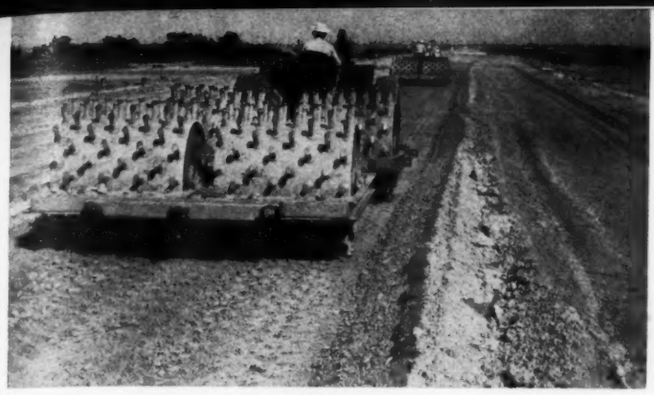

Looking west along the new road, two multiple batteries of Tampo sheepsfoot rollers are shown. International tractors are pulling the units. *Ray Day Photo*

certain to develop when mixing was done later on. After the initial setting period, the Seaman tillers moved in again and reworked the material, developing an intimate blend throughout the 14-inch loose lift.

If additional moisture was needed during this step, the small amount necessary was hauled in by a truck and gravity tank and sprayed on.

3. Layout and Compaction: Two motor graders, a Caterpillar No. 12 and an Austin-Western 99-M, were used to lay out the loose material. Working from the top of the 14-inch loose lift, the upper 10 inches of loose mixed material were first kicked out, and formed a windrow either in the center or on the side of the road. Because of its 4-wheel-drive feature, the 99-M proved to be an excellent rig for this purpose, according to Lige Bailey, general superintendent.

The 4-inch thickness remaining was then compacted by two International and Minneapolis-Moline tractors and four sets of Tampo sheepsfoot rollers. These rollers continued with their passes until the tamping feet walked up to the top of the material. The remainder of the lime-treated earth was then added in thin lifts by the motor graders, and rolling continued.

As soon as the lime stabilization was in, surveyors moved in and set bluetops at 100-foot intervals on the straightways, and at closer intervals on curves. Blade finishing and pneumatic rolling then brought the material out to true grade. The Texas Highway Department is an engineering organization which realizes the importance of placing each lift of a design course to close tolerance, so the lime-stabilized material was finished off to extremely close grade.

Studies made by soil technicians on the finished lime stabilization showed that where the plasticity index had originally been up between 45 and 50, it was now down to the 25-30 range, and in some cases, readings as low as 10 were found. The material was definitely stronger and had greater bearing value. In fact, according to Bailey, the contractor's troubles were over when the first 4 inches of subgrade had been worked with the fresh lime. After that operation, any of the trucks could use the subgrade safely.

Other Materials Follow

Select sandy material was hauled from Sabine Pass, about 13 miles from one end of the job. The pit site at this point had been specified by the Texas State Highway Department, and the major portion of the material came from this pit. After the operation began there, however, an alternate pit was found a few miles closer, and some of the material came from the latter location.

The Sabine Pass pit was operated by the subcontractor A. F. Jones & Son, Beaumont, who hauled about 1,000 cubic yards per day, weather permitting, with a fleet of 17 dump trucks and a ¾-yard Northwest machine. At the alternate pit, Trotti & Thompson used a ¾-yard Lima Paymaster dragline and a fleet of 10 dump trucks. This material was brought in, dumped according to volumetric content, bladed, road-mixed, watered, and then cut out

(Concluded on next page)

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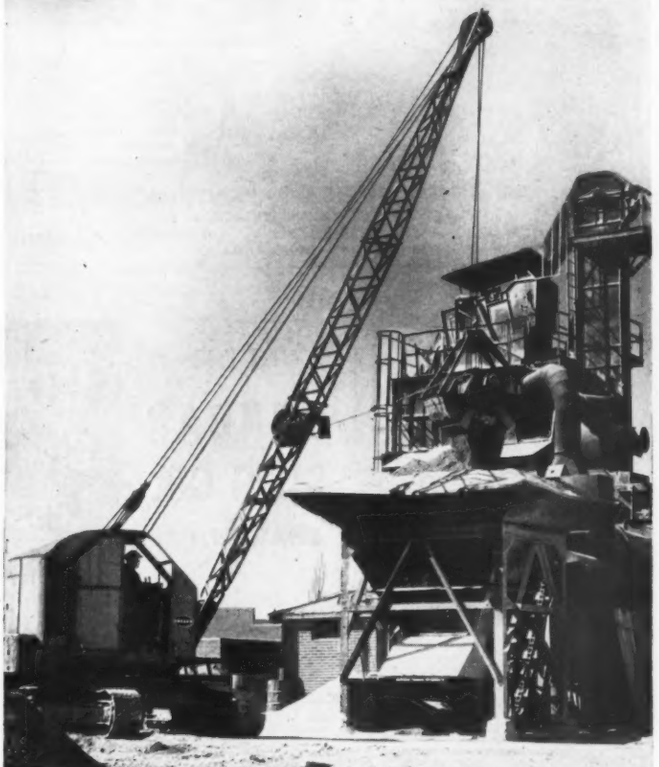

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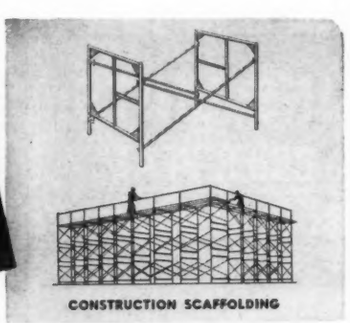

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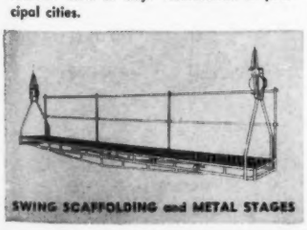

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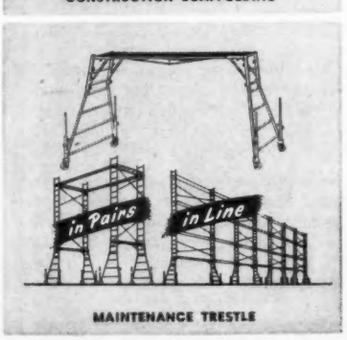

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Road Base in Texas

(Continued from preceding page)

and sheepsfoot-rolled in very much the same fashion as the lime-stabilized material had been handled.

The shell-material course consisted of a ⅓-yard sand admix, added to 1 cubic yard of washed oyster shell. The oyster shell was produced by W. D. Hayden at Port Arthur, Texas, and was hauled over a 6-mile run to the job. Oyster shell was dumped first and aerated 24 hours before the sand admix was brought in. The shell was placed in three courses, and each lift was processed after the sand admix was brought in. The Seaman tillers again gave invaluable assistance in blending the sand admix with the washed oyster shell, and after an intimate blend had been achieved, the material was sheepsfoot-rolled by the same equipment which had handled the lime stabilization.

After the last lift had finished out the required thickness of the material, a sealcoat of MC-1 was applied to prime the surface and protect it from any rain which might fall. When CONTRACTORS AND ENGINEERS visited the project, the contractor officials had not decided what hot plant would be used to mix out the asphaltic concrete. The company has just finished a hot-mix job near Orange, Texas, however, and it appears likely that the plant which was used at this location may be moved in to do the finished roadway.

Highway officials in the vicinity are watching with considerable interest the lime-stabilization experiment, because it appears to have given dramatic results. If the finished road holds its traffic without developing excessive maintenance costs, a new era of building roads with adverse materials may have been brought to the Beaumont vicinity. The presence of high plasticity index clay has always been a headache, but the use of lime to improve the material may be one of the answers.

Personnel

DeWitt C. Greer, state highway engineer for the Texas State Highway Department, has general charge of the job, and is assisted by John A. Waller, chief engineer of construction and maintenance; Jed Robinson, construction engineer; and W. E. Simmons, district engineer at Beaumont. Mark S. Swain was resident engineer, and was assisted by W. A. Potter and Harry Kieschnick on the project.

For Trotti & Thompson, L. A. Bailey was general superintendent, C. F. Hackney was in charge of dirt work, and Leon Sturrock was in charge of the lime-stabilization operation.

The Gradall with the new offset boom attachment.

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The attachment is added to the machine by clamping the shaft in the boom hinges and bolting the two top straps to the boom. The main boom tool-actuating cylinder may be transferred to the offset, or an integrally mounted cylinder may be obtained with the accessory requiring only the transfer of hose connections.

For further information write to the Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 357.

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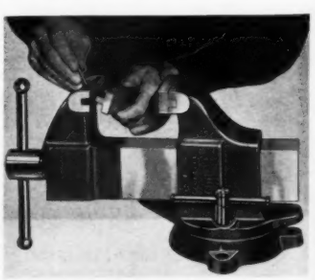

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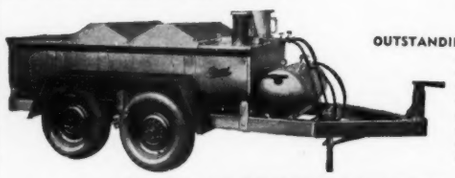

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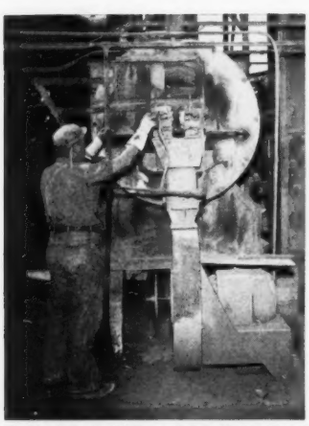

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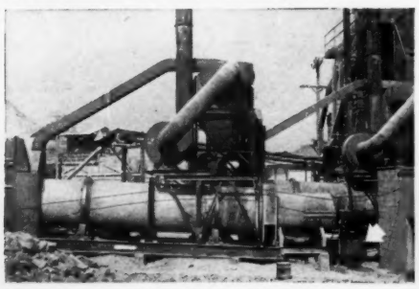

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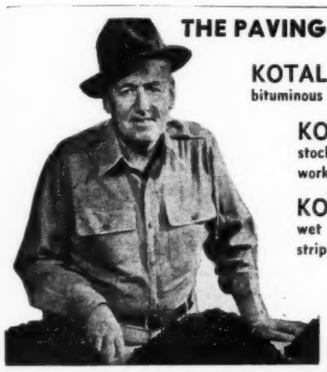

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1—Rome Disc Harrow, 4 sections, 6 discs per section, 28" diameter; Model M-24-28.

Group of 5—Southwest Heavy Duty Double Drum Sheepsfoot Rollers, Model TD2-102.

Group of 8—F. W. McCoy Heavy Duty Double Drum Sheepsfoot Rollers, Model USHD-65 and USHD-55.

2—Specially Built Smooth Rollers: One 3-drum tandem and the other 3-drum "in line".

4—Rock Rake Attachments for Heavy Tractors, with LeTourneau push-arm connections.

2—Worthington 2-Stage Electric Motor Driven Turbine Pumps. Model #12QGH2. Serial Nos. 1349448-49. Capacity 1500 G.P.M. at 110' Head Operating at 1770 RPM. Driven by 50 HP U.S. Vertical Electric Motors 3/60/440 V. Serial #852148 and 852145. New 1950.

2—Worthington 2-Stage Diesel Engine Driven Turbine Pumps. Model #12QGH2, Serial Numbers 1349450-51. Capacity 1500 G.P.M. at 110' Head Operating at 1770 RPM. Driven by General Motors PTA-11111 Diesel Engine, Serial #130592 and 131789. Equipped with Worthington Right Angle Drive Gear Heads and Watson Spicer Flexible Drive with Couplings. New 1950. Has had stand-by use only.

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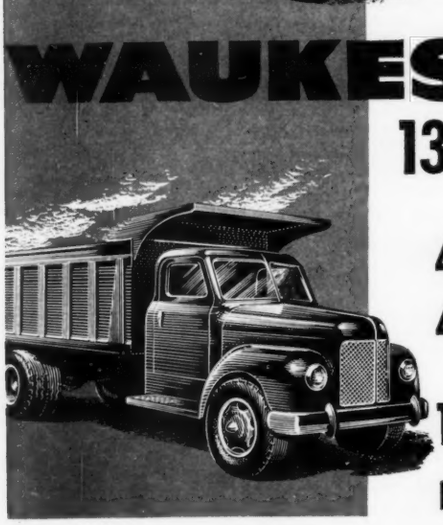

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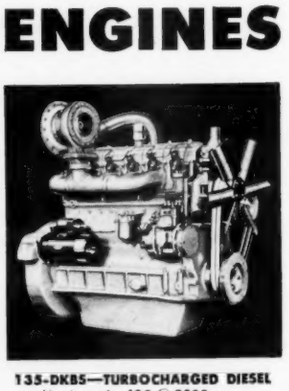

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Maximum hp 185 @ 2800 rpm.

213

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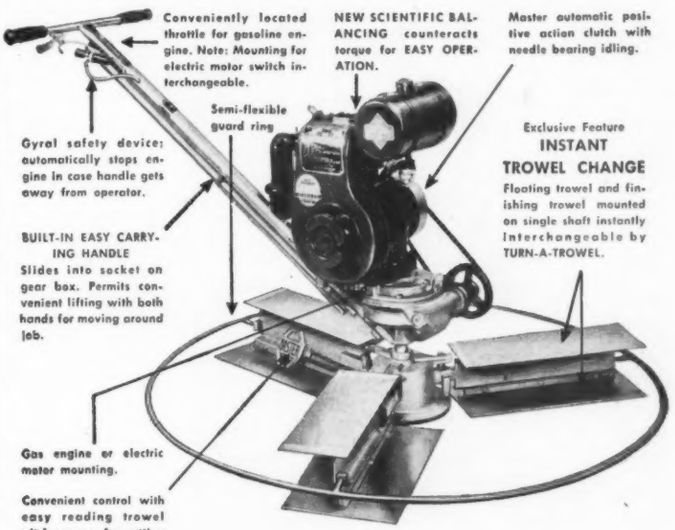
New TURN-A-TROWEL

AMERICA'S No. 1 BUY

FOR EASIER, FASTER FLOOR FINISHING

FOR FLOATING AND FINISHING CONCRETE WITH A SINGLE MACHINE 34" AND 48" DIAMETER

SET ALL TROWELS AT ONCE WITH ONE QUICK VARIABLE ADJUSTMENT


Conveniently located throttle for gasoline engine. Note: Mounting for electric motor switch interchangeable.
NEW SCIENTIFIC BALANCING counteracts torque for EASY OPERATION.
Master automatic positive action clutch with needle bearing idling.
Semi-flexible guard ring
Gyral safety device: automatically stops engine in case handle gets away from operator.
Exclusive Feature
INSTANT TROWEL CHANGE
Floating trowel and finishing trowel mounted on single shaft instantly interchangeable by TURN-A-TROWEL.
BUILT-IN EASY CARRYING HANDLE
Slides into socket on gear box. Permits convenient lifting with both hands for moving around job.
Gas engine or electric motor mounting.
Convenient control with easy reading trowel pitch gauge, for setting all trowels at once with one quick variable adjustment.

Write for Catalog 952

MASTER VIBRATOR COMPANY • DAYTON 1, OHIO

Master Portable Generator Plants ½ KW to 100 KW
Master Vibratory Concrete Finishing Screed
Master Power-Blow Electric Hammer and Spade
Master Space Heaters
Master Gas or Electric Concrete Vibrators

MASTER

BETTER PRODUCTS FOR BIGGER PROFITS

Manufacturer Memos

Pettibone Mulliken Names Representative

C. K. Taylor has been named district representative for Pettibone Mulliken Corp., Chicago, Ill., in the states of Ohio, Michigan, and Indiana.

Reporting to the Chicago home office from the Columbus, Ohio, headquarters, Mr. Taylor will serve distributors of Pettibone Mulliken and its subsidiaries—Universal Engineering Corp., Cedar Rapids, Iowa, and George Haiss Mfg. Co., Inc., New York, N. Y. These companies manufacture stationary and portable crushing and washing plants, loading equipment, material-handling buckets, and motor-grading equipment for the construction industry.

The Texas Co. Appoints

T. R. Ellis has been appointed assistant manager of the Asphalt Sales Department of The Texas Co., New York, N. Y., replacing J. B. Stuart, who has retired.

Mr. Ellis, whose headquarters will be in New York City, was formerly manager of the New York Division of the Asphalt Sales Department. This position has been taken over by H. J. White, previously representative at Jacksonville, Fla.

Mr. Ellis has worked for the Engineering Department of the City of Denver, Colo., and for the War Production Board. He joined The Texas Co. in 1936.

Gardner-Denver Promotes

A. G. Lindquist has been elected director of Gardner-Denver Co., Quincy, Ill., manufacturer of compressors, rock drills, pumps, and hoists. Mr. Lindquist joined the company in 1938 as comptroller, and was elected secretary in 1945. He retains both positions in addition to the directorship.

Three other appointments are also announced: A. H. Jones has become vice president, C. H. Rieman sales manager of the Mining & Contracting Division, and E. A. Linneman sales supervisor of the Contracting Division.

Edward O. Boshell, president of Westinghouse Air Brake Co.

LeTourneau-Westinghouse Purchase Consummated

The recent purchase of R. G. LeTourneau, Inc., Peoria, Ill., by Westinghouse Air Brake Co., Wilmerding, Pa., included all of LeTourneau's fixed assets and machinery at Peoria, Ill., Toccoa, Ga., and its interests in the Australian subsidiary for the price of $26,300,000.

Merle R. Yontz, president of LeTourneau-Westinghouse Co., Peoria, Ill.

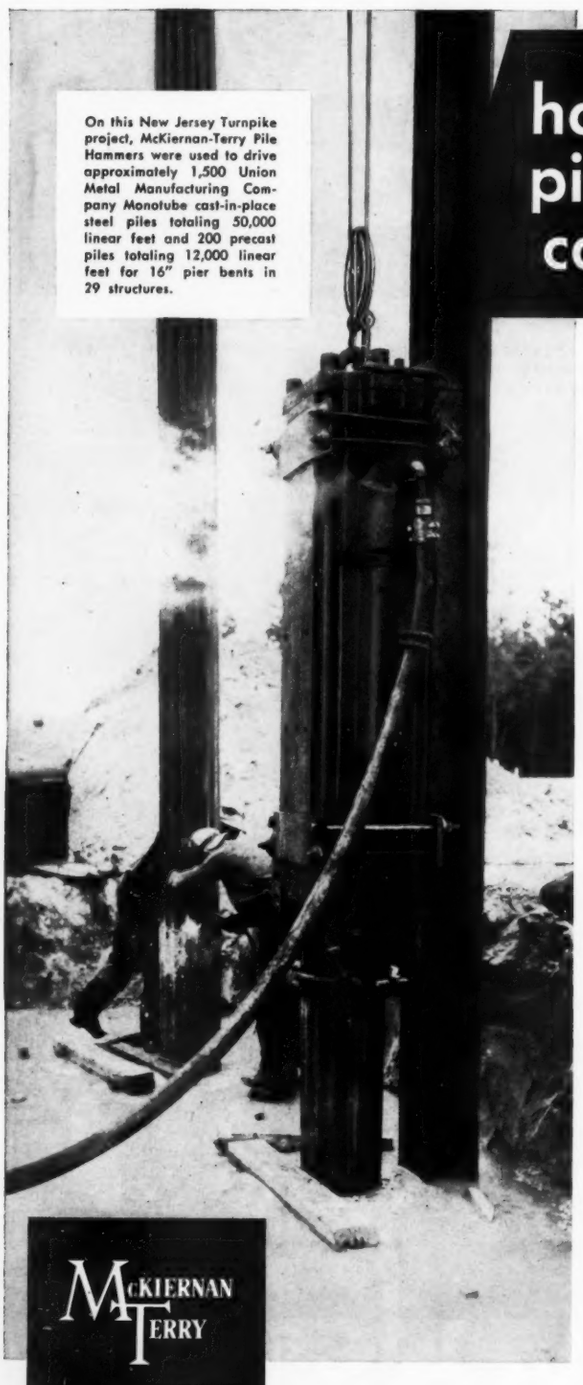
Edward O. Boshell, chairman of the board and president of Westinghouse was instrumental in the transaction. The new business will be operated as LeTourneau-Westinghouse Co., a subsidiary of Westinghouse Air Brake Co.

Officers of the new concern are Merle R. Yontz, president; Elmer Isgren, executive vice president; Herbert A. May, vice president; John Schoen, vice president and general sales manager; and Warren Wemple, vice president and controller.

Goodyear VP Re-Elected By Road Federation

Frank T. Magennis, vice president of Goodyear Tire & Rubber Export Co., has been re-elected chairman of the International Road Federation, Washington, D. C.

The Federation, founded in 1948 by businessmen, supports advanced training of foreign highway engineers and advocates greater international interchange of engineering and technical data. In cooperation with 45 national road associations, the Federation concentrates on promoting road consciousness among the public and governments, stressing the economic and social advantages of good highway communication.



On this New Jersey Turnpike project, McKiernan-Terry Pile Hammers were used to drive approximately 1,500 Union Metal Manufacturing Company Monotube cast-in-place steel piles totaling 50,000 linear feet and 200 precast piles totaling 12,000 linear feet for 16" pier bents in 29 structures.

hard pile driving conditions...

...but McKiernan-Terry Hammers helped to finish project ahead of time

The contractor's own words tell this story best. S. J. Groves & Sons Company reports: "We used three McKiernan-Terry 9-B-3 Double-Acting hammers and one McKiernan-Terry Double-Acting 11-B-3 hammer in the construction of 21 miles of the New Jersey Turnpike in Gloucester and Salem counties. *The driving was unusually hard,* the foundation being water-bearing sand and gravel in the pier foundations and compacted fill for the abutments. *The McKiernan-Terry Hammers stood up very well under this severe driving and we are well pleased with the performance of the hammers.* The work was completed ahead of time."

No wonder contractors all over the nation rely on the power and dependability of McKiernan-Terry equipment. The wide-range McKiernan-Terry line includes 16 sizes of pile hammers and 2 sizes of pile extractors. Write for Bulletin.

Other McKiernan-Terry Products

MEAD-MORRISON COAL AND ORE UNLOADERS AND BRIDGES
Available in a variety of designs and in capacities of 300 to 1500 tons per hour. Exceptional durability proven by installations in service for half a century. Simple controls afford convenient, comfortable and speedy operation.

GRAB BUCKETS
Range of types and sizes take bulk materials loads up to 25 tons. Ruggedness without excess weight.

HONING UP TO 42-IN. I.D. X 55-FT. LONG
Typical of the extensive facilities of McKiernan-Terry for unusual jobs.

McKIERNAN-TERRY CORPORATION • MANUFACTURING ENGINEERS • 19 PARK ROW, NEW YORK 38, N. Y.
Plants: Harrison, N. J. and Dover, N. J.
MK-331

Oscar J. Ellertson is President of Pioneer Engineering Works, Inc.

Ellertson Heads Pioneer

The Board of Directors of Pioneer Engineering Works, Inc., Minneapolis, Minn., has elected Oscar J. Ellertson as president of the firm and a member of the Board.

Mr. Ellertson has held a number of positions with the company, beginning as a purchasing agent. In 1952 he entered the sales department, where he served successively as salesman, advertising manager, assistant sales manager, and export manager. During this period he was also assistant secretary and assistant treasurer. Most recently he has been treasurer and vice president and since 1952, has been in charge of production.

Donald B. Palmer, Jr., who entered the employ of Pioneer in 1945, will cover sales of asphalt plants, pavers, and stabilizer plants in the United States and Canada, in his new position as bituminous sales engineer of the company.

Death of Sauerman VP

Dwight Dudley Guilfoil, vice president and sales manager of Sauerman Bros., Inc., Chicago 7, Ill., manufacturer of slackline cableways, died suddenly of a heart attack on May 3.

Mr. Guilfoil had been with Sauerman Bros. since 1913 except for a period during World War I when he was in the Army. He had been active at various times in the affairs of the manufacturers' division of the Sand & Gravel Association, the Associated Equipment Distributors, and other trade organizations.

Succeeding Mr. Sauerman as general sales manager will be Martin Meyer who has been with the company since 1943.

Hercules Powder Elects

Albert E. Foster, formerly vice president, has been elected president of Hercules Powder Co., Wilmington, Del., as well as chairman of the Executive Committee. He has worked for the company as a technical service man, assistant superintendent, assistant manager, and manager. In 1940 he became general manager of the Naval Stores Department.

Mr. Forster succeeds Charles A. Higgins who has been president of Hercules Powder Co., processor of cellulose chemicals and naval stores chemicals, since 1939.

Cleco Sales Manager

T. E. Donohue has been promoted to the position of Cleco sales manager, it was announced by the Cleco Pneumatic Tool Division of Reed Roller Bit Co., Houston, Texas.

Mr. Donohue joined Cleco in 1948 as assistant sales manager.

New Hough Representative

Frank G. Hough Co., Libertyville, Ill., manufacturer of Payloader tractors and tractor-shovels, has appointed Kenneth B. Larkin as district representative in its sales territory No. 7. This section covers the states of Washington, Oregon, Idaho, and Montana, and the Canadian provinces of British Columbia, Alberta, and Saskatchewan.

Mr. Larkin replaces H. E. Thomas, who becomes district representative of sales territory No. 1—Illinois, Michigan, Indiana, Ohio, Kentucky, and eastern Missouri.

Iron & Steel News

Max D. Howell, formerly executive director and treasurer, has been elected executive vice president of the American Iron & Steel Institute, New York, N. Y. B. F. Fairless, chairman of United States Steel Corp., and Ben Morreell, chairman of Jones & Laughlin Steel Corp., were elected vice presidents. A newly created position, that of assistant vice president, went to C. M. Parker.

George S. Rose was re-elected secretary, and E. O. Sommer, Jr., is treasurer.

New Ramset Manager

Clarke Tryon has recently been appointed sales manager of Ramset Fasteners, Inc., Cleveland, Ohio, newest division of Olin Industries, Inc., East Alton, Ill.

Mr. Tryon has been responsible for Ramset sales since the firm was organized in 1947.

This bulldozer's middle name is WORK

Repairing a break in the Tule River Levee, near Stratford, California, this Cat* D6 Tractor with a No. 6S Bulldozer handles 400 yards of fill a day. And it works *all* day and *every* day.

When a contractor wants to get a job done he uses equipment he can depend on. Caterpillar-built Bulldozers are that kind of equipment. Over any period of time their production records prove it.

Here's a rugged, clean-cutting blade, scientifically designed to roll earth instead of pushing it. Bigger blade loads are delivered without spilling or clogging cable sheaves. Heavy, box-type construction gives the 'dozer extra strength, prevents warping in tough material. And Caterpillar Cable Controls are positive acting, easy to operate and trouble-proof.

Your Caterpillar Dealer can supply the widest range of blade types in the industry, and he backs every piece of equipment he sells with prompt, reliable service and genuine parts. Ask him for a practical, on-the-job demonstration today.

Caterpillar Tractor Co., Peoria, Illinois.

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*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

Virginia contractor gets double value from his 2 Tournapull prime-movers

Robertson, Bolen & Fowler, Inc., Buchanan, Virginia, had to handle both scraper dirt and shovel rock when they widened 3.8 miles of U.S. 11 between Staunton and Lexington. They held equipment inventory to a minimum, but kept maximum job efficiency by making their 2 D Tournapulls do "double duty". These 2-wheel, 122 h.p. prime-movers were used to power both 7-yd. Scrapers and 9-ton Rear-Dumps.

With Scrapers, deliver 10 loads hourly on 1700′ cycles

Hitched to the Scrapers, the 2 D Roadster prime-movers helped move about 100,000 yards of clay, sand, gravel, and shale. In typical operation, each rig was push-loaded with 5½ pay yards in 20 seconds. Complete 1700′ cycle took 5 minutes. That's 10 trips (55 pay yards of dirt) per 50-minute hour for each Scraper rig.

With Rear-Dumps, move 9 loads hourly on 2000′ cycles

When rock was encountered, the Scrapers were detached and the prime-movers hitched to rear-dump Tournarockers. Change took only a few hours. As rear-dumps "D's" helped haul about 140,000 yards of shovel-loaded slate, feldspar and shale. Rigs' primary advantage in rock work was maneuverability. Loading from narrow hillside cuts, Tournarockers drove up to the shovel, turned 90°, and spotted in a few seconds. Conventional dump trucks, working in same cramped space, had to maneuver back and forth to get into cut. Tournarockers hauled rapidly, too. Despite heavy, open traffic (5,000 vehicles daily), they completed average 1500′ cycles in 5¼ minutes . . . 2000′ cycles in 5½ minutes . . . 9500′ cycles in 12½ minutes. Load time for 10 tons of rock averaged only 1½ to 2½ minutes at all times. And here's another advantage:

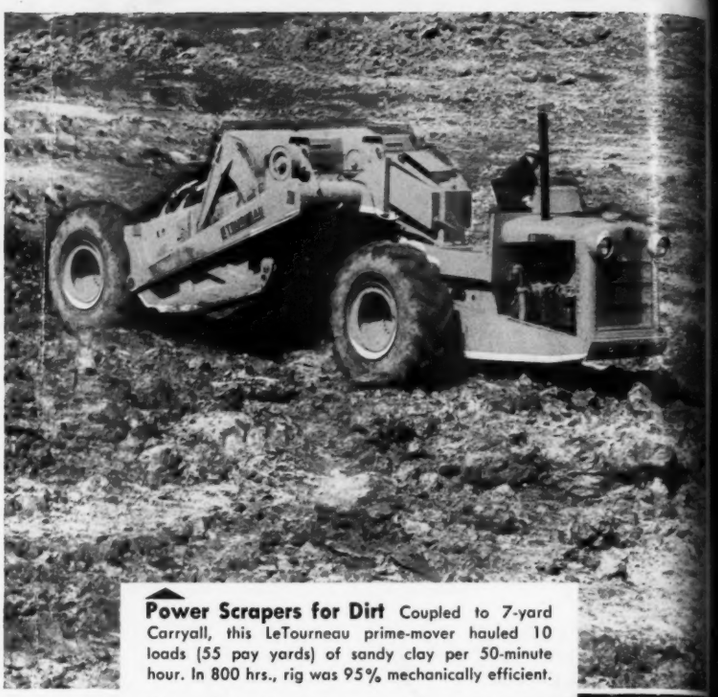
Work better in wet weather

"Tournarockers worked better in wet weather than other haulers," says Partner M. O. Fowler. "This equipment is really all right! It hasn't given us any trouble on these tough hauling jobs."

Adds Operator H. C. Hite: "I like the way the 'D' turns in tight places. In wet going, you can cut crossways when you mire up and pull right out."

If you're interested in getting this kind of performance on your work, see your LeTourneau Distributor. He'll be glad to show you the "D" in action, either with a scraper or rear-dump. He can also tell you how the 122 h.p. "D" may be coupled to an interchangeable crane or flatbed. Dozer, snow plow also available.

Tournapull, Tournarocker, Carryall — Trademark Reg. U. S. Pat. Off. DPR-225-H a



Power Scrapers for Dirt Coupled to 7-yard Carryall, this LeTourneau prime-mover hauled 10 loads (55 pay yards) of sandy clay per 50-minute hour. In 800 hrs., rig was 95% mechanically efficient.

Change to Rear-Dumps for Rock Same prime-mover, hitched to Tournarocker, worked in narrow quarters where ordinary trucks lost time turning and spotting. "D" can turn non-stop in 12′4″ radius.

For 24 years, the leader in rubber-tired dirtmoving

LETOURNEAU LET EQUIPMENT

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS